Bell Telephone MAGAZINE

SPRING 1959

"In the long run it is the man himself who must assume full responsibility and accountability for his own growth."

VOLUME XXXVIII NUMBER ONE SPRING 1959

Bell Telephone Magazine

A non-technical review, published quarterly to give Bell System management people a broader view of the history, objectives, operations, and achievements of this business than they might attain in the course of their day-to-day occupations, and an added sense of participation in the problems and accomplishments of our nation-wide public service.

COVER: "In the long run it is the man himself who must assume full responsibility and accountability for his own growth." Painted for this issue by *Charles Mazoujian*

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A MEDIUM OF SUGGESTION and A RECORD OF PROGRESS

JUDSON S. BRADLEY, *Editor* SALVATORE J. TAIBBI, *Art Editor*

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Who's Who & What's What In This Issue

Edmund B. Bruner

EDMUND B. BRUNER, who contributes this issue's first article, started his telephone career in 1930 in the Commercial Department of the Illinois Bell Telephone Company, where he became successively manager, district commercial manager, and division commercial manager. In 1949 he went to the Wisconsin Telephone Company as general commercial manager, later becoming general traffic manager, and in December 1952 he was appointed vice president in charge of Personnel. Mr. Bruner joined the American Telephone and Telegraph Company as assistant vice president in the Personnel Relations Department in 1955, where his interest in management development includes training, appraisal, college employment, and personnel research.

THE ARTICLE on Bell System Taxes is ALEXANDER L. STOTT's third contribution to this MAGAZINE. In the Autumn 1956 issue he wrote "People and Telephones—More and More of Both"; and the Autumn 1957 issue carried his article "The Challenge of Modern Telephone Accounting." Mr. Stott started in the chief statistician's division of the Comptroller's Department of A. T. & T. in 1929, transferring to the Long Lines Department a decade later, where he remained until 1942. From 1942 to 1945 he served in the United States Navy, attaining the rank of commander. He rejoined A. T. & T. in 1945, in the Treasury Department, and moved over to the Comptroller's in 1949. In 1952 he became treasurer. A year later he assumed his present office of comptroller.

JOINING the Pacific Telephone and Telegraph Company in 1926 as a student,

Alexander L. Stott

FRANK H. CASE progressed through various responsibilities in the sales organization to the position of division sales manager. After a year as staff assistant at headquarters, he became assistant secretary and assistant treasurer. In May 1955 he transferred to the American Telephone and Telegraph Company as general financial supervisor in the Treasury Department, and since December of that year has been assistant secretary. He is, of course, particularly concerned with the activity which is the subject of his present article.

EMRYS P. LEWIS joined the Bell Telephone Company of Pennsylvania in the Eastern Area of Philadelphia in February, 1949, as a traffic student. After a series of assignments in field, staff and traffic engineering in Pennsylvania he became district traffic superintendent, Jenkintown, in 1956 and traffic engineer-dial administration in the Eastern Area in April 1958. He transferred to the American Telephone and Telegraph Company in the Operation and Engineering Department in the traffic methods group in July 1958 as an engineer. Here his responsibilities consist of coördinating and following up all traffic activities in the Bell System directly concerned with the Number Service Task Force recommendations.

Frank H. Case

Emrys P. Lewis

A NEWCOMER to this MAGAZINE, DAVID F. ROBINSON has been with the Western Electric Company since February 1957. In December of that year he was made assistant editor of *The Observer*, a monthly newspaper serving the Company's installation division. He then moved to the advertising staff and shortly thereafter became press relations representative in the information organization; here he was responsible for *News Briefs*, a news bulletin circulated to the Company's management people. Since March 1, 1959, he has been a staff writer in a new public relations group, in which capacity he continues to publish *News Briefs* in addition to new responsibilities in the field of public affairs and supervisory information.

THIS ISSUE carries ELIZABETH WRENSHALL'S tenth annual contribution on the topic of the world's telephones. Once more we note

(Continued on page 56)

One step in the manufacture of Stalpeth telephone cable. Using a coating of steel, aluminum, and polyethylene in place of lead, its development by Western Electric has brought about great economies. *See the article beginning on page 37.*

"To serve well and prosper, Bell Telephone Companies must attract and keep capable employees . . . And we must continually develop first-rate leaders for the future"

RECOGNIZING OUR RESPONSIBILITY FOR DEVELOPING MANAGERS

EDMUND B. BRUNER

Assistant Vice President, PERSONNEL RELATIONS DEPARTMENT, A. T. & T. CO.

A FRIEND AND I were discussing one day a championship football game we had seen the previous Saturday. As we talked about the hard, driving runs, the fierce blocking and tackling, and the spectacular forward passes, we began to draw some comparisons between the coaches of the two teams and the leaders of businesses today.

On a Fall Saturday afternoon, the chips are down for the coach of a football team. During the play of the game, he can't take time to teach his men the fundamentals of blocking and tackling. By game time, it's too late to drill the players in their respective assignments for any given play. The coach doesn't have time then to work with an individual player on how to play his position. And if he hasn't identified his best players by the time Saturday afternoon rolls around, he runs the risk of fielding a team that may operate far below the potential of his squad.

Leaders of businesses – and our business is no exception – are in much the same position as the football coach. The big difference is that the chips are down every day for them. The problems, though, are much the same: Are the key spots in the business filled by the best people available? Are there adequate replacements – both in numbers and quality? Are the replacements prepared and ready to fill any spot for which they are needed? Has the recruiting job been adequate to assure a supply of capable people who can be equipped to meet the requirements of the future?

Questions like these have given rise to an increasing interest in the problems of management development among most businesses today. Many of the outstanding leaders throughout the country have emphasized from time to time the importance of qualified managers to the success of any enterprise. As in the case of first-class football players, however, they do not come readymade. They have to be produced.

There have been some significant changes in our American business environ-

ment which we believe have created this growing concern with management development.

1. Growth—in the total economy and in individual organizations.
2. The trend toward decentralization, which raises the requirement for more executive ability in middle management ranks.
3. The rapidity of changes in technical, social, political, and economic conditions which greatly increases the complexity of the manager's job.
4. Greater acceptance of the fact that much of the knowledge and many of the skills essential to good management can be taught and that people can be stimulated to acquire this knowledge and these skills.
5. An increasing awareness that many people operate below their capabilities.

In common with most other companies, we have had a large postwar growth, and the demand for managers has kept pace. The competition for capable talent has grown and will continue to grow. As we look to the future we can only conclude that we will need more people, that we will need better people, and that we will have need for them to develop faster than in the past.

If this is true – and we cannot afford the risk that it may not be true – then it appears that our best effort must be directed to the solution of this problem. For in Mr. Kappel's policy statement, "The Trust You Have Placed in Us," this responsibility becomes quite clear:

". . . Clearly, we occupy a position of great public trust. . . .

"The success of the business depends on the people in it. To serve well and prosper,

Much of the knowledge and many of the skills essential to good management can be taught.

Bell Telephone Companies must attract and keep capable employees. They must be well paid and have opportunity to advance in accordance with ability. And we must continually develop first-rate leaders for the future.

"Finally, it seems to us it is always our duty to act for the long run . . . So is the building of the human organization and character on which good service depends. So is the training of leaders. In all our undertakings, the long view is essential.

"This is the way we understand the trust you have placed in us. It is a trust that deserves, and will continue to receive, the most painstaking care we can give it."

Should development activity be guided by a well conceived plan—or left to chance?

LET'S SEE what this means specifically in terms of developing first-rate leaders in the Bell System.

What do we mean when we talk about the need for a management development program? Management development has been defined as the process of producing business leadership.

It includes all of the actions and influences — whether generated by the manager being developed, his boss, his associates, or the company — that affect what a business manager knows and can do, how he thinks and makes judgments, how he works, and how he grows as a leader.

A manager, therefore, is being developed all the time — throughout his entire career — as a result of such elements as his own natural abilities and drive, his education, job experiences, his bosses. This means that the question of whether or not to undertake a management development program is irrelevant; we do not have the choice to do or not to do. Something is happening continually.

The real question then is — "Should development activity be guided by a well-conceived plan, or should it be left, in whole, or in part, to chance?" Too often we may have consoled ourselves that we could safely postpone a training or developmental experience until a more convenient time. When we do this we are fooling no one but ourselves. If we accept a poorer performance than we want, we are influencing our subordinates just as much as if we were taking a positive course of action.

This points up some of the weak spots that can hamper a development program even when it is undertaken with the best of intentions:

1. A lack of clearly-defined objectives.
2. Isolated activities which do not add up to a comprehensive plan.
3. Failure to take advantage of the problems of the business to stimulate the growth of management people through the challenges which these situations present.
4. Lack of support by bosses who look just for immediate and specific day-to-day results, rather than these *and* reasonable preparation for the future.

Planning a Development Program

THERE ARE A few basic assumptions that need to be made in the planning of a development program.

First of all, men need to be encouraged to think beyond their immediate jobs. By thinking in terms of the over-all business, a manager can often produce a better performance in his present assignment. At the same time he can develop capabilities that prepare him for a bigger job with more responsibilities.

Development is the product of total experience extending over a long period of time. Development, good or bad, continues as long as a man is in the business. Therefore, if the development is not to be left to chance, there can be no arbitrary termination date for planned activities for anyone.

The desire for self-development on the part of an individual is the key to the situation. The organization can help direct this desire toward Company-oriented objectives. The organization can provide stimulation and opportunity. The organization can strengthen the drive for growth. But in the long run it is the man himself who must assume full responsibility and accountability for his own growth. We must make that very clear, especially to our young people.

Operating on these assumptions, then, the following suggestions, I believe, constitute the principal requirements of an adequate continuing management development program.

A Program of Management Development

A COMPREHENSIVE PROGRAM of management development is composed of many interrelated parts, the principal objectives of which are to stimulate and support the desire for self-development in the individual. Hence, balanced and concurrent activity in at least the following areas seem to me to be desirable in order to achieve an adequate continuing program:

Acceptance of Goals and Objectives for Management Development. Before any program — and this one especially — can be carried through effectively, its goals and objectives must be clearly understood and accepted throughout the management organization.

Assignment of Responsibilities for Accomplishing the Goals and Objectives, and Acceptance of Personal Accountability. One of the major problems in management development is that of stimulating and supporting self-development in the individual. Since this involves not only the individual but also his superiors, and other line and staff people, satisfactory results are unlikely until responsibilities for action are carefully defined and assigned.

Encouragement and support for this drive toward self-development come partly from the direct impact of the boss, and partly from the business environment which the supervisor and the whole organization create and maintain. To make the program a challenging one which encourages growth, everyone involved — the man, his boss, and all those responsible for his training — should feel personally accountable for making him a better manager and for doing it in a shorter time.

Recruitment and Selection of Good Management Talent to Meet Future Manpower Requirements. To set a target against which to direct development activities, it is obviously essential to know the manpower requirements ten or more years hence — quality as well as numbers — at each level in the organization. To meet these requirements, with the expected growth of the business and the significant losses due to retirements which lie ahead,

early identification of those people with management potential becomes a necessity.

College graduates provide an excellent source of manpower to augment the talent currently available within the business. The magnitude of the management development job, as well as the ultimate quality of management, can be materially affected by the quality of the recruiting job.

Comprehensive Standards of Performance as a Basis for Assessing Management Potential. Standards of performance should define for the individual what kind of performance is expected of him. If such standards are fuzzy or too narrow, many individuals will tend to perform that way. Only if the standards are clear, comprehensive, and Company-oriented can we produce the broad-gauge improving performance necessary for the long pull.

An accurate assessment based on these comprehensive standards can assist in determining the quality of the current job performance and the individual's developmental needs, as well as providing a valid basis for judgment about his potential for advancement. Specifically, such an assessment should be the means for determining a development program for each individual, including plans for improving his performance, decisions regarding his placement, and his training needs.

Use of Appropriate Developmental Activities. The major approaches available are: on-the-job coaching, formal training courses, special assignments, and other training experiences. While each approach makes a contribution, the best results can be expected only when they are used to fully reinforce each other.

On-the-job coaching, through the boss' day-to-day formal and informal contacts with his subordinates, is the most important way to increase the effectiveness of management people. Because coaching is such an important role, the boss should be equipped to perform this activity effectively.

It is essential to know the manpower requirements ten or more years hence.

Formal training courses are an economical way to impart systematically the known skills and knowledge in the art of management to large numbers of people.

Special assignments, including job rotation, tend to provide challenging experiences, as well as broadening the knowledge and skill of the people involved.

Other training experiences, such as college programs and special seminars, offer opportunities to broaden the view of selected management people as to conditions inside and outside the business that are likely to bear on its future well-being and to counteract the in-growing effects

Special assignments, including job rotation, tend to provide challenging experiences.

of our policy of promotion from within.

In encouraging men to grow, they must be given risks to take as well as take risks themselves, and the resulting errors must be accepted as a cost of development. I don't think we can over-emphasize this point. The man who is seeking to grow must have the opportunity to do so. And he must be fully accountable for his performance — his failures as well as his successes.

Development of Training Programs to Meet Known Needs. A complete and readily available description of management training courses can be an effective aid to supervisors in selecting appropriate training experiences to meet the developmental needs of their people.

We must recognize, however, that the rapidly changing technical, social, political, and economic conditions create new and increasing demands on management people. Accordingly, it is important that managers, including those responsible for management development planning, be constantly alert for opportunities to improve existing training experiences and to develop new ways to meet these needs as they become known.

Programming Action According to the Needs Developed. Effective planning should be based on a determination of individual needs and should also take into account the total effort that is required to do the job. The size of the program should be a composite of the developmental needs

of the management people, rather than one based principally on what can be done with relative ease.

Projecting a future program on the base of a completed one may prove to be a false method. Most of us have done the relatively easy tasks associated with training. The challenge is to do the really difficult. By this we mean to determine the training needs of the organization and then to provide the people with the time and money to do the job as it should be done. Much otherwise important effort is either wasted, or proves less effective than it should, because it is spread too thin and over too long a time span.

It is sometimes difficult to do the things that are necessary to determine training needs and then to do the work that is involved.

We need to acquire the same mature approach to management development that in general exists toward craft or clerical training. It's a long time since anyone has seriously questioned the value of craft training. It is generally accepted that when people are put on new jobs it is more effective and more economical to train them to do the work you expect of them.

This is even more important for management people than for craft.

An Organization Structure and Climate that are Conducive to Management Development. Formal training, special as well as regular job assignments, college and university courses, and similar influences, all have significant contributions to make within the framework of a comprehensive management development program. It is important to recognize, however, that without the support and encouragement from the over-all business environment, they in themselves do not develop managers.

Use of Incentives. All incentives, tangible or intangible, negative or positive, should be reviewed on a continuing basis to see that they are being used constructively to help realize the aims and objectives of management development, as well as the other purposes for which they were designed.

Personnel Records. A personnel records system that makes readily accessible needed historical and current information about employees — records that can be used individually or combined for groups — will assist materially in providing basic data needs for the identification, movement, and promotion of managers, as well as other information essential to an adequate continuing program.

It seems to me that too often we are likely to ask the questions which can be answered by our existing records. The heart of the problem, though, is determining the questions that should be asked and then setting up the kinds of records that will produce the answers to such questions. This will have to be done if we are ever to have the means of taking a talent inventory.

A Company-wide records system will also permit general supervision of the movement and promotion of people with potential. This seems important if we are to insure the most effective use of available talent.

Evaluation. Since so many factors affect the success of training and developmental efforts, caution is needed in the assessment of any one particular activity. However, the total management development effort, as well as any one of the parts, should be evaluated in terms of the progress being made in the requirements listed above.

Our Responsibility

A PROGRAM such as this one places emphasis on the responsibility of the man himself for his own growth and development. But it also defines the responsibility that each of us as supervisors has in identifying potential leaders, in stimulating and encouraging their desire for self-development, and for making available to them opportunities that will enhance their growth.

It is the business and responsibility of each of us as supervisors to cultivate and, in general, promote the freedom of thought and action that will permit full growth of the potential leaders available in the business. One effective way to bring this about is for each of us to ask ourselves some rather tough questions and insist upon honest answers. If the answer isn't good, then comes the $64 question: "What shall I do about it?"

Some of these questions that we have to face up to are:

1. Are we bringing into the business the numbers and quality of people we need? How does this business appear to the people it wants to hire? Is our selection and weeding out process discriminating enough?
2. Are we doing what we should do with our promising young people? Are they quickly assuming responsibility for their own growth? Do their bosses have a realistic view of what teaching the knowledge and skills of management requires?
3. Are we using work assignments effec-

A personnel records system will assist materially.

Are the goals of the business discussed with our promising young men?

tively for our promising people? When we "rotate" a man, is there a specific intent in mind for his development?

4. Have we made it clear that the development of subordinates is an important part of every manager's job? Do we take management development performance into account when appraising managers for promotion or salary consideration?
5. Are we consciously using work on special studies and community relations work for the development of people? Do the bosses of men assigned to this work make sure that some growth takes place?
6. Are the jobs of our promising men organized right? Do they have broad enough scope so that each can feel responsible for a result and have the satisfaction of achievement when he gets a good one and feel the penalty of failure when he misses?
7. Are the goals of the business discussed with our promising young men in such fashion as to give them a lift and stimulate the industrious application of their skills and loyalties?

ASKING QUESTIONS like these and demanding good answers is, I believe, important to producing a climate of opportunity for those with ability. In an atmosphere of opportunity like this, many able leaders will be available to the business.

The Bell System is a business dedicated to service of an ever increasing scope and quality — a business dedicated to fulfilling "The Trust You Have Placed In Us." The ability to realize this goal depends on many things — adequate earnings, new and improved equipment, more efficient methods,

teamwork among employees at all levels, and leadership of the highest quality. If our developmental activities don't produce that kind of leadership — leadership that can look ahead, plan constructively, and act effectively — and produce it faster than it has been produced before, then they are not worth doing.

CONTINUING to develop qualified leaders is an important part of the operation of the business. There are no trick formulas, however, no easy roads to the successful development of manpower. We can only suggest that it is a lot of hard work and that perseverance and faith are required in large quantities, because there can be no absolute guarantee of success. However, if we're dissatisfied with where we are and want to do better, then a good course open to us is to use what we know about development and use that in the best possible way to build as we go.

For only in this way can we reach our goal, which is:

1. To assure the numbers of managers with the required skills to meet the future needs of the business.
2. To encourage managers to grow as persons and in their capacity to handle greater responsibility.
3. To improve the performance of managers at all levels in the jobs they now hold.
4. And to sustain good performance by managers throughout their careers.

Only to the extent that we accomplish these things will we be able to say that we are meeting our responsibility for developing managers.

Some facts which are of utmost importance to the progress and well-being of this Nation and of every person in it

TAXES: THE UNCONTROLLABLE COST

ALEXANDER L. STOTT

Comptroller, AMERICAN TELEPHONE AND TELEGRAPH COMPANY

IN THE YEAR 1958 — a year of business uncertainty — it was particularly important for the Bell System companies to control costs wherever it was possible to do so without affecting service. As general business slowed down in the early part of the year, every effort was made to reduce expenses in line with the changing situation. The result was that operating expenses, exclusive of depreciation, were lower by some $14 million in 1958 than in 1957.

But what about taxes — aside from wages the largest single item in the cost of furnishing telephone service—and an item over which the System has little or no control? In contrast to other costs, Bell System operating taxes increased by more than 15% in 1958 over 1957.

The telephone customer, who in the long run foots the entire tax bill of the telephone business, probably doesn't realize how much of his telephone bill is represented by taxes. He knows that he pays a 10% excise tax on his monthly charges. But in addition to this tax, which he can see, there is a burden of operating taxes which he cannot see. Together, operating taxes and excise taxes add on the average $4.67 to his monthly bill. One wonders how much more of the Nation's tax burden can be thrust upon the telephone business without affecting the Bell System's ability to provide adequate telephone service at reasonable rates. Not only customers but employees, too, should be concerned. Heavier taxes on telephone service will increase its cost, restrict its use to fewer persons, and reduce job opportunities in the business.

The Total Tax Load

LET'S LOOK at a few facts about Bell System taxes. In 1958, our operating taxes, i.e., the taxes paid directly by the telephone companies, were almost $1½ billion ($1,483,150,000)—larger than traffic and commercial expenses combined. They far exceeded maintenance costs on our $20 billion of plant and were well over twice the dividends paid to our 1,600,000 share

OPERATING TAXES TAKE MORE THAN THREE TIMES AS MUCH OF OUR REVENUE DOLLAR AS IN 1920

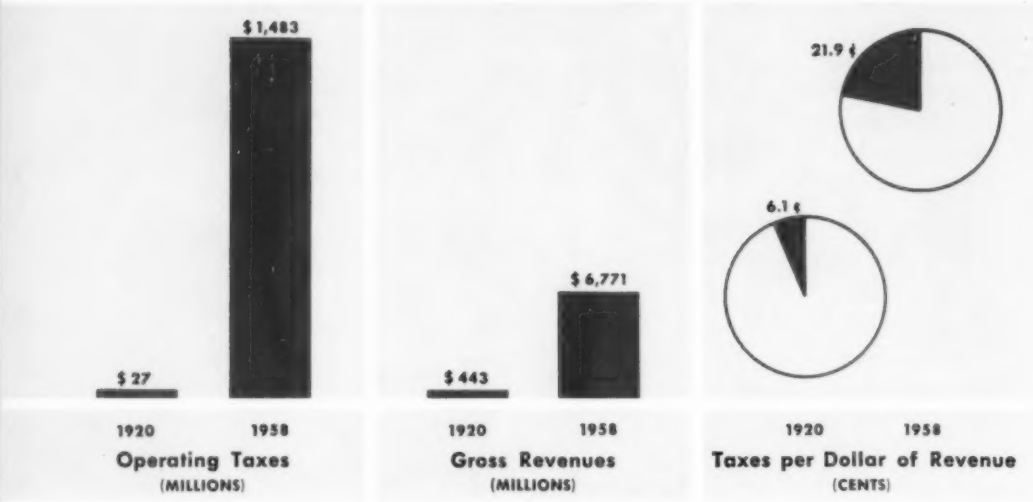


Chart 1

owners. In addition, our customers also paid the Federal government some $550 million in excise taxes. Together, these taxes came to over $2 billion in 1958, or more than –

$38 per telephone,

$56 per customer, and

$3,300 per Bell System employee.

Under the Federal income tax laws, the Federal government is a 52% partner in any profits resulting from our operations. In 1958 our Federal income tax amounted to just less than $915 million. In addition to the Federal income tax, there are many different varieties of taxes levied on the property of the telephone companies, their gross receipts, income, etc., by state and local governments. In 1958 our taxes in these areas amounted to about $520 million. Further, the Bell System companies withheld from employees' wages some $450 million on account of their personal income and social security taxes and the companies paid social security taxes in behalf of their employees of another $50 million.

In all, these taxes (including excise taxes) came to over 2% of all tax collections of Federal, state and local governments. In other words more than $2 of every $100 of taxes to pay for all expenses of government in this country came from Bell System customers and employees. As taxpayers and employees, nothing deserves our attention more than this heavy tax burden.

Telephone Service Is a Target for Taxes

Of course taxes have always been a part of the cost of providing telephone service. A few decades ago, however, taxes were a relatively minor item in our over-all costs—not a major item as they are today.

Chart 1 shows that Bell System operating taxes in 1920 were $27 million while in 1958 they were almost $1.5 billion, or over

fifty times as large. This chart also shows that taxes have taken an ever-increasing portion of our revenue dollar, ranging from 6 cents per dollar of revenue in 1920 to nearly 22 cents today. And if excise taxes are included, 28 cents of every dollar paid by our customers for their telephone service represents taxes. Whereas in 1920 operating taxes took $1 out of every $16 of revenues, today they take $1 of every $5 of revenues. If this trend should continue, it will be increasingly difficult for the Bell System to meet the future communications needs of the country.

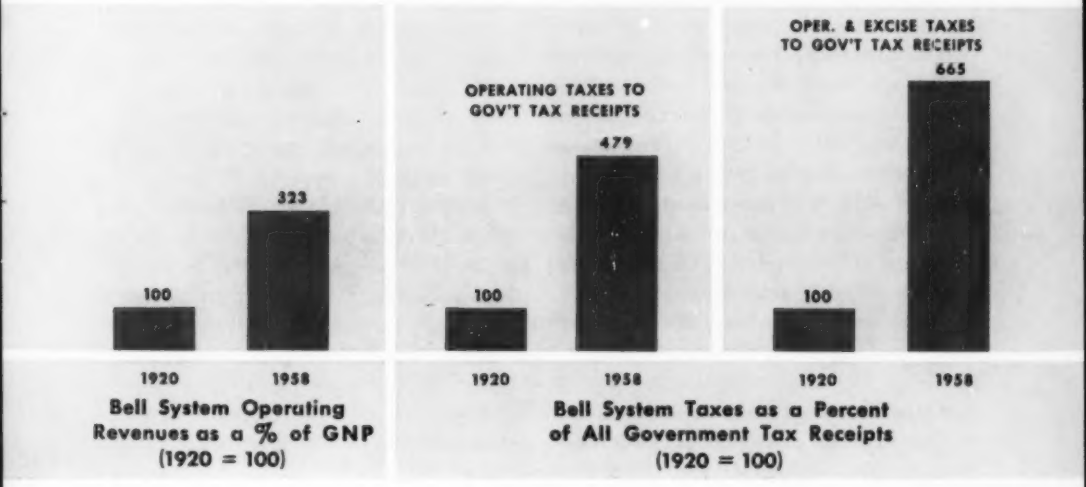
Chart 2 illustrates that telephone service has been a target for taxation. In this chart Bell System growth in revenues is shown in relation to the growth of the over-all economy, and Bell System growth in taxes is shown in relation to growth in tax receipts at all levels of government. The chart shows that Bell System revenues as a per cent of Gross National Product are somewhat more than three times as large today as in 1920. However, Bell System operating taxes as a per cent of total government tax receipts are almost five times as large today as in 1920. In other words, while the Bell System today is three times as large a part of the Nation's economy as it was in 1920, it pays five times as great a portion of the Nation's tax bill as it did in 1920. Furthermore, including communications excise taxes paid to the Federal government by our customers, telephone taxes as a per cent of total government tax receipts are nearly seven times as large today as in 1920.

Chart 2

BELL SYSTEM CUSTOMERS PAY AN INCREASING SHARE OF NATION'S TAXES

Today the Bell System is three times as large a part of the national economy as in 1920 - but it pays nearly five times as large a part of the tax load. Including excise taxes, it pays nearly seven times as large a part of the tax load as in 1920.

Index Numbers: 1920 = 100



Federal Income Tax Is the Largest Tax

THE FEDERAL INCOME TAX of 52% of taxable income represents the Bell System's largest single tax. We estimate that it will amount to around $1 billion for 1959.

The preparation of our tax return is a formidable task. The ground rules are set out in the Internal Revenue Code, a volume of some 1,000 pages. Supplementing the Code are countless volumes of court cases, regulations, and rulings which must be taken into account. A steady stream of these implementing decisions, regulations, and rulings pours forth from courts and administrative bodies and must be constantly followed for Bell System effect. This meticulous and time-consuming job is done by the General Tax Section in the Comptroller's Department and by the Tax Division of the Legal Department.

Excise Tax Is Unfair

THE FEDERAL EXCISE TAX imposed on telephone service is clearly an unfair tax. We have seen that this 10% tax amounts to over one-half billion dollars a year. As Mr. Clifton W. Phalen pointed out in the previous issue of the BELL TELEPHONE MAGAZINE, the telephone is the only household utility which is subject to excise tax. This tax was first imposed as a revenue-producing measure in the depression years. During World War II the level of rates was substantially increased to produce more revenue and to hold down use of telephone service in order that manpower and materials could be diverted to the war effort. There is no justification for this tax in the tax structure today—almost 15 years after the end of the War. The Bell System is speaking out against this tax and urging that, when tax laws are revised, this excise tax on telephone service should be among the first to go. Customers and employees also should be heard against this discriminatory tax.

Other Taxes Are Rising Rapidly

STATE AND LOCAL TAXES take a great many different forms. Of these, property taxes involve by far the largest amount of money for the Bell System. From $18 million in 1920, our property taxes have risen to $325 million in 1958 and there is every reason to expect that they will continue to rise in the future.

State and local gross receipts taxes and income taxes are also large and will undoubtedly continue to climb as the states and municipalities seek additional funds to meet their rapidly growing expenditures. Bell System payments for these taxes rose from $2¼ million in 1920 to over $150 million in 1958.

Other taxes, such as Federal and state social security, unemployment, capital stock, and franchise taxes, while not as large as the taxes just mentioned, now amount to nearly $100 million annually—and also have been rising steadily.

Taxes Are a Major National Problem

PRESIDENT EISENHOWER sounded a warning for Congress against excessive non-defense appropriations with these words: "The Government should spend only what is necessary. It has very great responsibility to combat inflation through tighter control on Federal spending."

Heavy requirements for national security cannot be avoided in the world of today. It is therefore all the more important for spending in civilian areas to be carefully controlled. However, the fact is that non-defense expenditures in the Federal budget have been soaring—expenditures for "civil benefits," for example, are estimated at $10 billion more in 1959 than in 1954.

GOVERNMENT IS TAKING AN INCREASING SHARE OF NATION'S PRODUCTION

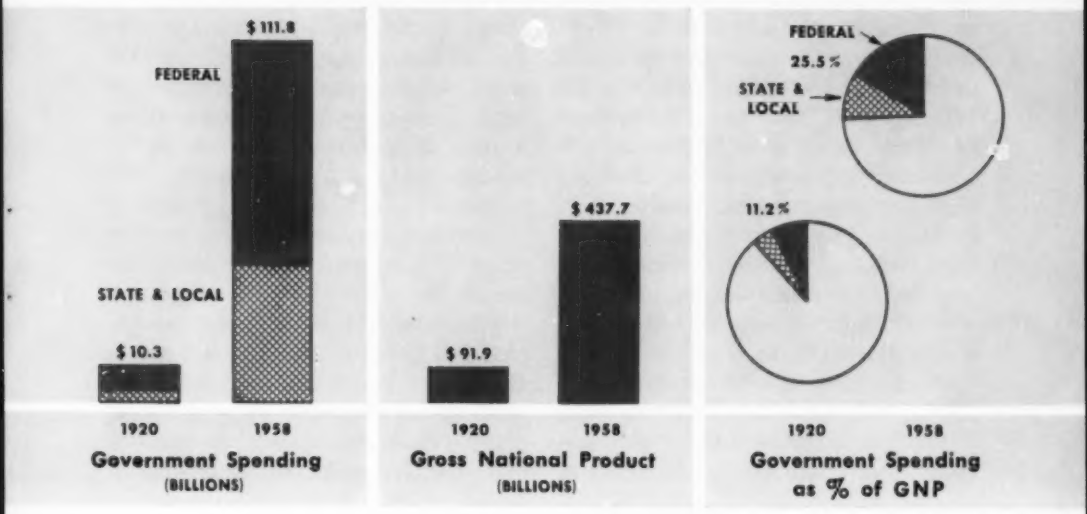


Chart 3

It is now anticipated that receipts of the Federal government for the current fiscal year will fall short of expenditures by some $13 billion. The Federal debt limit was raised recently to $288 billion because of this situation, and it will probably have to be raised even higher in the future. For the foreseeable future, Federal budgets will probably continue in the $80 billion range—a level exceeded only in two years, and these were during World War II.

It is generally admitted that a substantial gap between the expenditures of the Federal government and its tax revenues is a source of inflation. Tight controls on spending, as the President has urged, will help close the present gap but it is possible that more tax revenues may also be needed. If heavier taxation is the cost of combating inflation, it must be borne—because no single threat is as dangerous to the future welfare of the country as inflation. But in levying any additional taxes, Congress will have to use great care so as to cause as little strain as possible on the Nation's already heavily taxed economy. To maintain a rising standard of living for our Nation, it is necessary to have an economic climate that will foster initiative and encourage individuals to save and invest in the great new ventures of tomorrow. The problem is not an easy one, since both burdensome taxes and inflation are detrimental to such an economic climate.

The total budget expenditures of all Federal, state and local governments in fiscal 1958 were over $110 billion and will certainly be higher in 1959. The tax situation of state and local governments is quite as pressing as that of the Federal government. In the postwar period, state and local

tax receipts have increased at a faster rate than Federal tax receipts. Nonetheless, state and local expenditures have been well in excess of tax receipts, and these governmental units have had to borrow heavily, with the result that their debt increased from $16 billion in 1946 to $56 billion in 1958. Now, under the pressure of rapidly increasing population and demands for expanded services, state and local governments are searching in all directions for new forms of taxation. It has been estimated that the expenditures by state and local governments may rise from $44 billion in 1958 to the $75 billion range during the next decade.

Chart 3 shows how government spending has been increasing in relation to the spending by other segments of the economy. From about $10 billion in 1920, government spending increased to $110 billion in 1958 and amounted to 25% of the Gross National Product – or more than twice the percentage in 1920. Federal expenditures alone were up from 7% of Gross National Product in 1920 to about 16% in 1958. While state and local spending has been fairly steady in recent years at around 10% of Gross National Product, it has risen some $40 billion since 1920 and promises to take an even larger percentage of the Nation's production. All government taxes on a per capita basis, including social insurance, rose from $390 to over $660 in just the period from 1946 to 1958.

Who Pays the Bill?

WHATEVER the level or purpose of taxation, tax revenues in the last analysis come from the productive work of the people of this Nation. The people must be made to realize that, with heavy defense expenditures continuing, a crushing tax burden will inevitably result if government tries to provide all of the other services which some are advocating. Government cannot insure full employment, support all worthy causes, subsidize agriculture, provide security for all, and do the many other things which have been urged as its role, without taking a far larger portion of the income of the people of the country as taxes. Reliance on government spending to solve all our difficulties can only lead to excessively high taxes, and this ultimately would jeopardize the economic progress of the Nation. Excessive taxation increases the prices of goods and services, encourages tax evasion, stifles initiative, reduces job opportunities, and dries up the venture capital so necessary for continued growth and for the creation of new and better goods and services.

Here, then, are a few of the areas of the present tax situation that must be of concern to all:

1. Aggregate Federal, state and local government spending, including social insurance payments, is now nearly $20 billion above the peak levels of the War years, and is constantly increasing.
2. Federal expenditures in the current fiscal year will probably exceed receipts by $13 billion. Federal deficits contain the seeds of further inflation.
3. State and local taxes will continue to increase rapidly for the next decade or so. Tax policies in this critical area will have a vital effect on the Nation's economic progress.
4. High tax rates lead to pressures by special interests for favored treatment or exemptions. Favored treatment erodes the tax base to the detriment of the general taxpaying public.
5. Taxation based on "ability to pay" has already been carried to dangerous extremes. Proposals advocated

under this guise, such as that for a graduated corporate income tax with rates ranging up to 75% of taxable income, could have a serious effect on our economy.

6. Unduly high taxes on business will thwart its efforts to produce better goods and services at reasonable prices, adversely affect our standard of living, and in the long run "kill the goose that lays the golden eggs."

Conclusion

EVERYONE recognizes the need for paying a fair share of necessary Federal, state, and local taxes. What taxes are "necessary" and what constitutes a "fair share" for corporations and for individuals are subject to debate. However, individuals must bear in mind that in the final analysis they and they alone foot the entire tax bill. This means that all corporate taxes, as well as personal taxes, are paid out of the productive work of individuals—people like you and me. The people are therefore greatly affected by the amount of the Nation's tax bill and by the way in which the taxes are imposed. For this reason, everyone should have a deep interest in governmental taxing and spending policies. It is evident that taxes can be kept at reasonable levels in the long run only if government spending is carefully controlled. It has been said that "taxes are everybody's business." This is everlastingly true, and so it is up to "everybody" to consider whether the present high level of government spending is really in the best interests of the country. Apathy can be the worst enemy in trying to solve one of the biggest problems of our time—Taxes!

INDEX NOW AVAILABLE

AN INDEX to Volume XXXVII (1958) of the BELL TELEPHONE MAGAZINE may be obtained without charge upon request to the Public Relations Department of the American Telephone and Telegraph Company, 195 Broadway, New York 7, N. Y.

The MAGAZINE is also reproduced on microfilm: one volume to a single roll of positive film, suitably labeled. Inquiries concerning microfilms of the MAGAZINE should be addressed to University Microfilms, 313 N. First Street, Ann Arbor, Mich.

Dividing Bell System records into three groups, for preservation, inexpensive storage, and destruction brings new economy and promotes efficiency

HOW RECORDS MANAGEMENT IS CUTTING COSTS

FRANK H. CASE

Assistant Secretary, AMERICAN TELEPHONE AND TELEGRAPH COMPANY

KEEPING TRACK of records in the Bell System is a $28 million annual task. And the threat of an even larger and more expensive records-keeping job is so great that a relatively new field of administration is in the spotlight called Records Management. Its job is to find new ways of cutting this annual expense.

To understand better how Records Management works, let's first look at the kinds of papers that we are talking about.

The tons of records created daily in the System fall into two categories.

First are the corporate records. These include minutes of directors' meetings, contracts, deeds, and other legal papers. Since they have a special purpose and the volume is small, maintaining them is no problem.

The bulk of our records, however, are of a general nature and fall into the three types shown below:

Filing "immediate use" type of records is wasteful expense. Holding papers of the other types longer than needed on the job or to comply with Federal Communications Commission regulations or other legal requirements creates problems.

There's an easy way out, of course. Buy more file cabinets. But when you do, your expenses will jump more than you think.

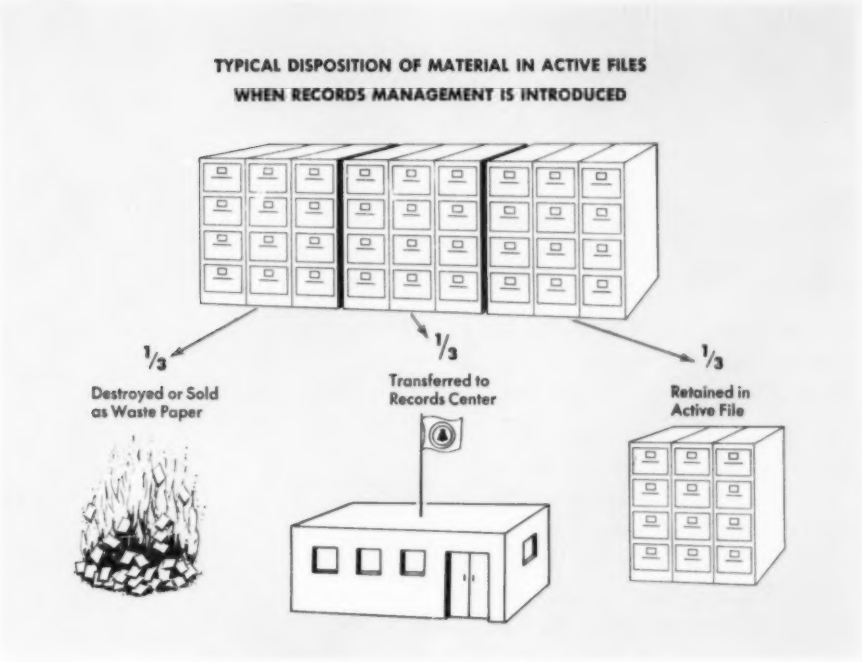
Modern file cabinets are expensive. So

TYPES OF RECORDS

Immediate use—serve an immediate purpose but have no further value. They should be destroyed, not filed.

Limited life—needed on the job for a few months to a year. These records have no value beyond that time and should then be destroyed.

Longer life and permanent—after serving a need on the job, these records must be kept for a number of years or permanently for company or legal reasons. Generally during this latter period little reference is made to them.



With Records Management, only about one third of the records are retained in office files

is the labor for maintaining them and the space they occupy. Minimum over-all cost of maintaining one four-drawer file cabinet of records for a year is $140. In most cases this cost is considerably higher. There are more than 200,000 such cabinets in Bell company offices creating the $28 million annual expense.

Here's an illustration of how easily and quickly the cost could pyramid:

If each employee in the System prepared only two sheets of paper each day for file, there would be enough papers to fill 23,000 new four-drawer cabinets each year—at an annual expense of more than $3 million.

There's a better way to solve the records problem—a way that drastically cuts expenses and makes for efficient handling of records:

Use the proven techniques of Records Management, which provide for

- **determining the life cycle of each record used in the business**
- **setting up a plan for prompt destruction of records no longer needed**
- **establishing facilities for storing inactive records at the least possible cost**

LAUNCHING a planned Records Management program isn't easy. As a matter of fact, the decisions involved are similar to those of a homeowner. What do we keep? What do we throw away? How's the best way to store what we keep and where?

Inactive records in inexpensive cardboard cartons on steel shelving frequently twelve feet high are efficiently stored but always available

An inactive Records Center in a low rental district affords efficient, inexpensive storage for records that must be retained for various periods

When should we reconsider throwing away the things we do keep?

Biggest block to effective Records Management, however, is the urge to "keep the records, just in case," and to "put off the task until a rainy day."

But making these decisions and overcoming the blocks is well worth the time and effort.

Twelve of the Associated Companies have introduced Records Management in their business.

The results? They discovered that one-third of the records in their office files could be destroyed immediately. Another third were so inactive they could be moved to low-cost storage centers. In the end, only one-third of the records were needed at job locations where space is expensive and limited.

Applied to the whole System, this would mean a savings of $18 million a year.

FIRST STEP in a Records Management program is an inventory of files in each office by records representatives. Purpose is to determine what records there are.

Along with the inventory, a retention schedule is prepared. It lists each record by form number or a simple description and shows how long to hold the record.

In preparing the retention schedule, care must be taken to be sure that records are retained in the business as long as they are needed and that regulatory and other legal requirements are met.

Another important step is moving inactive records that must be kept for several years or permanently to inexpensive storage areas. Considering that about one-third of office files are inactive, big savings can be made in moving them from work locations where space is expensive.

The answer is an inactive records center in a low rental district. An older building formerly used as a central office or a leased building can be renovated and equipped as a suitable center. Most centers in the System are of these types. A few Bell System centers have been designed and built especially for records storage.

Studies in Bell System companies show that the cost of storing one cubic foot of inactive records in a specially designed center is about $1.25 per year. *The cost of storing the same cubic foot of records in an office work location is $25 a year or more.* Therefore, moving inactive records to low cost records centers can save almost as much as destroying files that are no longer needed.

HERE, BRIEFLY, is how the Records Management system works.

After retention schedules have been prepared, records no longer needed are destroyed. Those which are not used in doing a job but which must be retained are pulled from the regular office files and sent to inactive records centers.

In preparing inactive records for storage, a transmittal form is prepared. The form identifies the records and tells the records center how long the records must be held before they can be destroyed.

The records are placed in inexpensive cardboard cartons for both shipment and storage. Upon arrival at the center, the boxes are numbered and one copy of the transmittal form showing the numbers is returned to the sender as a receipt and for reference. The other copy is kept as a reminder to get authority to destroy the records when the destruction date arrives. No other forms are needed.

Key to inactive storage, of course, is a properly equipped building with facilities for quick and inexpensive handling of the records. Since inactive records are occasionally referred to, provisions must be made for prompt reference service.

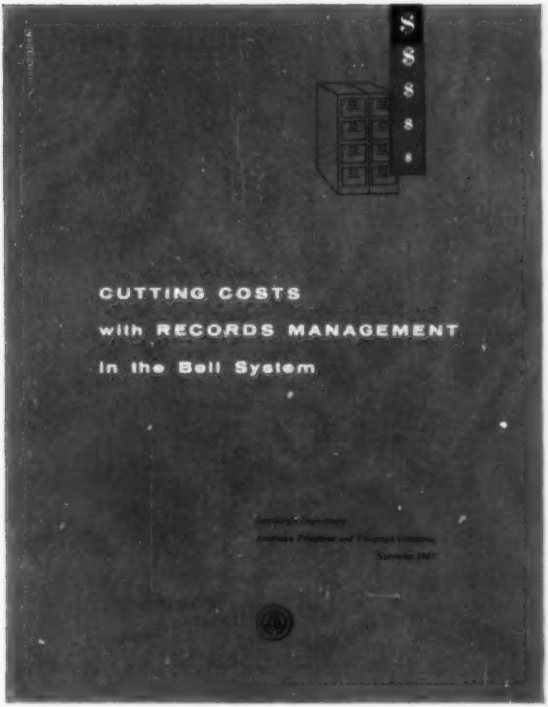
Thirty-one inactive records centers are in service in the Bell System, and the companies are finding the records center idea to be highly practical. Additional centers are in the formative stage.

As an aid in tackling this new field of administration, the Secretary's Department of American Telephone and Telegraph Company late in 1957 issued a book, "Cutting Costs With Records Management in the Bell System." The book describes pro-

RETENTION SCHEDULE — Company Alpha Tel. Co. — Department A — Date 10-15-58

Form No.	Title or Description of Records	Retention Period: In Office Files	Retention Period: Total Period
1	Transfer Sheets Common Shares	2 yrs.	Perm.
2	Bank Register	1 yr.	6 yrs.
3	Payroll Changes	1 yr.	3 yrs.
4	Toll Settlement Data	6 mos.	6 mos.
5	Request for Information - Acctg. Forms	6 mos.	1 yr.
6	Time Report	2 yrs.	10 yrs.
7	Monthly Progress Report	3 yrs.	5 yrs.
8	Summary of Messages by Circuit Groups	1 yr.	1 yr.
9	Summary of Wiring Units Removed or Abandoned - Station Installation - Telephone and Miscellaneous	Perm.	Perm.
10	Summary of Credits to Prepayment and Liability Accounts	1 yr.	10 yrs.
11	Daily Work Report	1 yr.	3 yrs.
12	Supplies Requisition - Tools - Miscellaneous Only	2 yrs.	6 yrs.
13	Adjustment of Telegram Charge List	6 mos.	6 mos.
14	Final Report of Irregularities	3 yrs.	6 yrs.
15	Monthly Summary of Shipments	2 yrs.	Perm.

The retention schedule is a catalog showing the life cycle of each record in the business



Procedures and facilities which have been found effective are described in the book "Cutting Costs with Records Management in the Bell System"

cedures, plans, and facilities which have been effective in the Bell System to fight the records-keeping problem.

As a result of the book, and earlier efforts on their own initiative, many of the companies are introducing Records Management or are sharpening existing programs.

One of the companies, New York Telephone Company, took a dual approach in setting up its program. While getting a regular program under way in 1958, it launched a separate "crash-type" project to rid its office files of records no longer needed.

In a one-year period more than 3,700 four-drawer file cabinets in offices were emptied. About 60 per cent of the records that came out of the cabinets were destroyed. The remaining records were sent to newly established inactive records centers. The project has brought about savings of a half million dollars a year. In addition, more than 10,000 drawers of records that had been in storage were destroyed.

Savings realized by the companies with Records Management programs will have long range effects. Yet only the surface has been scratched. Potential savings run into the millions of dollars. A lot of pioneering work on Records Management already has been done. There's plenty of room for more. The big pay-off is yet to come.

Providing practical and convenient telephone number service is an increasingly complex problem for today and for the years to come

WHAT'S BEHIND THE NUMBERS GAME

EMRYS P. LEWIS

Engineer, TRAFFIC METHODS GROUP,
OPERATIONS DEPARTMENT, A. T. & T. CO.

TELEPHONE EXCHANGE SERVICE began without telephone numbers: just customers' names in a telephone directory—a one-page directory at that. Soon numbers became a necessary part of telephone service. Then numbers grew longer, and included office names. Now in some locations we are dialing straight through to telephones at distant points using three-digit area dialing codes and the telephone number. And, in prospect—who knows?—perhaps there is world-wide dialing with more numbers and codes. The wonders of our telephone system would not be possible without telephone numbers, but these numbers by the millions bring their own set of problems.

We are serving up numbers in generous proportions today—about 44 million of them; and almost every one of them represents a listing in a telephone directory. Estimates indicate that these listings might well double in the next 10 to 15 years. Directory size and compilation problems are of increasing concern with this growth in prospect.

The records used by the Information operator and her operating equipment will certainly require close examination, with such growth predicted.

Information calls are slightly over two per cent of our originating calls, but they represent a tremendous segment of our business and are becoming a larger proportion of the work handled by our operators. The handling of more than a billion and a half calls to Information annually requires an operating expense of about $105 million per year and requires 26,000 operators in the Bell System, not to mention the other thousands of people who are engaged in compiling directories and associated work.

Recognizing the Need

WITH A JOB of this proportion and with the growth prospects in the coming decades, it is clearly a situation that requires much study and attention. This need was recognized and a "task force" was set up in 1956 to make a thorough study of all phases of number services. The nine men of the

Information *is a large and growing segment of Traffic service.*

task force were drawn from Traffic, Directory, and Public Relations Departments of the Associated Companies. Bell Laboratories also contributed their services to the group. These men studied in detail the entire subject to seek courses of action to better meet service needs today, and to set directions for the near and distant future. The work now being done throughout the Bell System along the lines suggested by the task force report attests to the need for such a study and to the thoroughness of the job done by the task force.

In order to determine a starting point, a survey was taken in three broad categories: residence customers' number habits; why customers call Information; and analysis of Traffic Information calls. From these studies, other reference material, consultation with other people both within and outside the telephone business, and the knowledge and experience of the nine men of the committee, came the Number Service Task Force report in April, 1958. Over one and a half years' work was needed to cover the whole problem and report on it—which is another measure of the magnitude of the problem.

In the report were several conclusions; but more significant, the report pointed the way for further study and research.

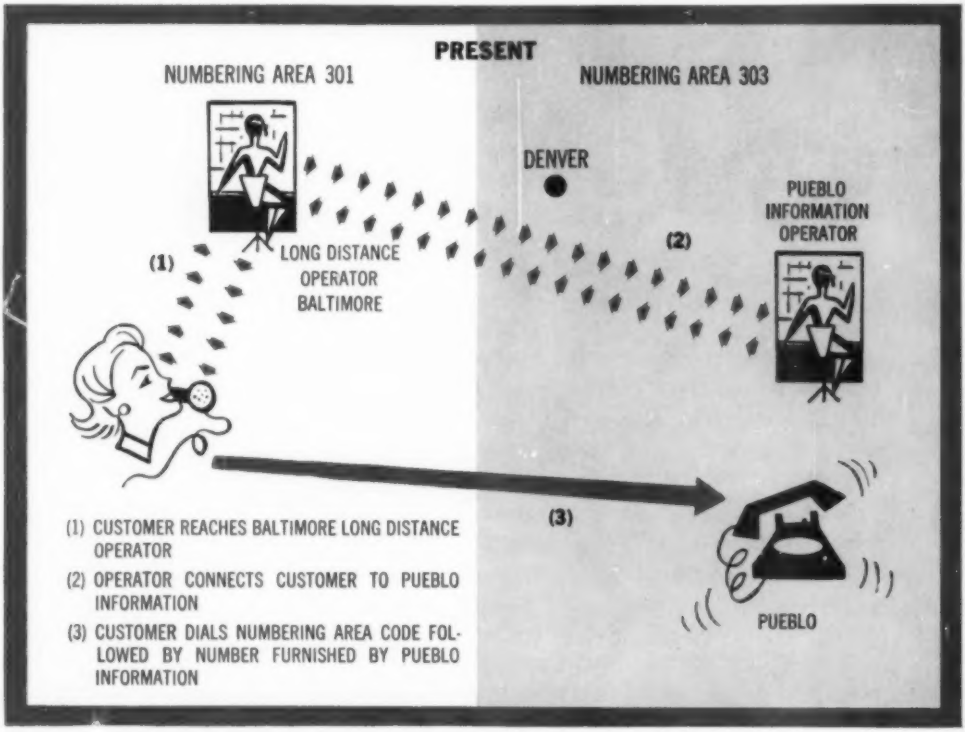
Even the present size of Information *records presents its problems.*

A Universal Information Number

ONE OF THE important items studied was the functioning of number services under Direct Distance Dialing, to which the System is rapidly turning. This presented the immediate problem of how number service should be handled for the customer in New York who wants to dial someone in San Francisco but whose number he does not know. It seems quite clear that the customer should be able to dial to the Information operator in San Francisco, get the number wanted, and then dial it directly himself. This not only is faster for the customer but also eliminates the long distance operator who, under present methods, must connect the customer to the distant Information operator and assist him in getting his called telephone.

The idea was conceived of using the area dialing code followed by a seven-digit universal Information number to reach the distant Information operator, who would have information records for the entire numbering area. And this universal number would be used to reach Information in any area merely by prefixing the area dialing code—just like dialing any other telephone number in a distant place.

In fact, right now we are trying to find the ideal number for this use. The number should be easy to remember, should work in all types of dial equipment, and should be available everywhere, i.e., in each of our present and future numbering areas. You might think that with 44 million numbers,



Information *service under present DDD operation*

we could find the right one for this purpose without too much difficulty, but we've set ourselves a tough standard, and are still considering several possible choices.

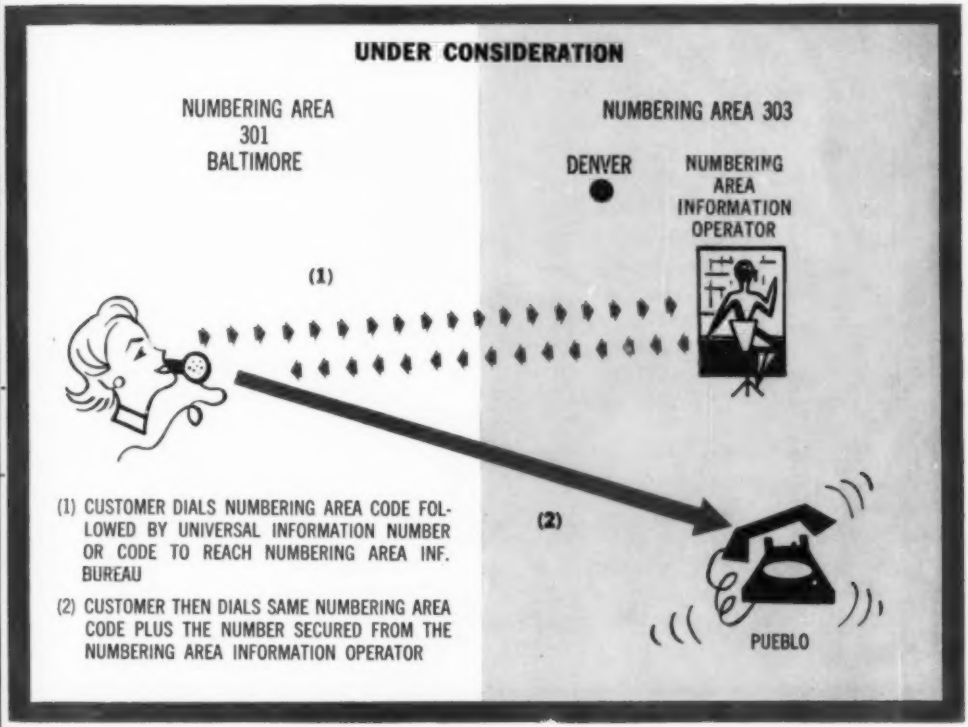
Even when the number is selected, there will be some technical difficulties to be overcome, such as a means of avoiding charging customers when they dial to distant information.

The Bulk Problem at Information

WHEN THE IDEA came up of an operator at her position having all the records for a numbering area, which in some cases is an entire state, the question of where to put all the directories came right along with it. In fact, even without this advanced idea, the problem is already here. In New York City, for example, each Information operator has about 95 pounds and 15,000 pages of directories, with over 5 million listings. Imagine a directory a full yard thick!

The solution to this problem may well lie in an entirely new concept of operator records, such as on microfilm or in a microprint form. With systems such as these, up to 12 million listings can be stored at each position on cards or in the form of film strips. Reading these records can be done through an optical system that magnifies and projects the printed page on a screen that looks something like the face of a television tube.

A trial of microprint records and new positions designed for their use was made


UNDER CONSIDERATION
NUMBERING AREA 301 BALTIMORE
NUMBERING AREA 303
DENVER
NUMBERING AREA INFORMATION OPERATOR
(1)
(2)
PUEBLO
(1) CUSTOMER DIALS NUMBERING AREA CODE FOLLOWED BY UNIVERSAL INFORMATION NUMBER OR CODE TO REACH NUMBERING AREA INF. BUREAU
(2) CUSTOMER THEN DIALS SAME NUMBERING AREA CODE PLUS THE NUMBER SECURED FROM THE NUMBERING AREA INFORMATION OPERATOR

Simplified plan for DDD Information *service now under consideration.*

last summer in Washington, D.C. Another trial is under way in New York City, this time using simulated microfilm records and positions as well as the microprint records and positions from Washington in order to directly compare operating features. Besides the reduction of bulk and the ability to read the records, the speed with which the operator can handle calls on these positions is of great importance.

With each second of Information search time equivalent to about two million dollars in the Bell System, the search time on these new positions should be equal to or better than the present equipment. Both of these trials are aimed at obtaining the right solution economically and practically to the record storage problem, which in some places is serious now and can become critical.

Of course, there is also the problem of gathering together all the records for the numbering area into one place. In some concentrated numbering areas all the records already appear on the operator's position. In other numbering areas, where the area covers an entire state, the gathering together of the up-to-date records for the entire numbering area presents a new problem requiring some original thinking and perhaps some new ideas.

The Operator and Direct Distance Dialing

"313-WA3-9911." Under Direct Distance Dialing, this is the way the customer dials a station-to-station call into the toll network. It seems logical that this also should be his method of placing calls with the operator when they cannot be dialed, e.g., person, collect, credit card. And it makes good sense too, since the operator will not be required to look up routing information, but can speed the call on its way immediately. She may not know the place called, but she won't need to for routing the call. Some of the things being worked on now are the arrangement of this routing material for the operator, and an approach to the customer to induce him to place calls with numbering area code and number.

Of course, underlying this whole method of placing calls will be the job of making the customer realize that the distant area code is a necessary part of the telephone number when he calls distant places. Publicizing his own telephone number with his own area code on business forms, letterheads, and other stationery will also be helpful to those calling him from distant places. He will increasingly realize, we feel, that by using the area code both in placing calls and in publicizing his number, his service will be faster, more accurate, and simple and easy to use.

Customers Want Directories

As we continue to grow toward the number of telephones the statisticians have predicted for us, the directories approach the limits of practical use. However, despite its growing size, its lack of a plot and the host of other comments heard about it, the telephone directory continues to be one of the most popular books in America, a real best seller on anyone's list; and a basic source of telephone numbers.

In the Task Force studies, our customers' response to questions about their use of directories was revealing. In small cities, the telephone directory was referred to on about 18 per cent of the calls from residence telephones, while in the large cities its use averaged less than 10 per cent. Judging from this, you might think that customers in the larger cities wouldn't miss the directory much if we took it away. On the contrary, 72 to 82 per cent of these customers reacted strongly against the sugges-

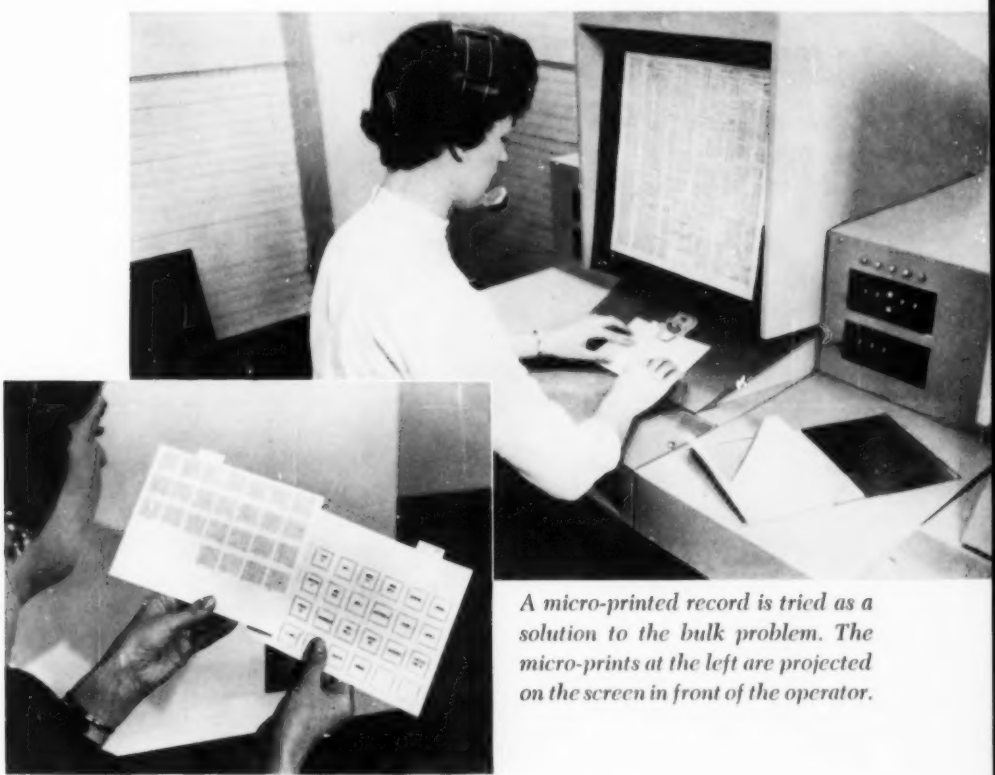
tion that we discontinue the alphabetical directory. Customers indicated in the study that they like to have the directory handy, apparently not only as an original source of telephone numbers for keeping up to date their Blue Books and refreshing their memory, but for other things such as addresses and correct name spelling. From this study, it appears that directories fill a real need for our customers.

One of the most interesting and useful results of the surveys taken was the answer to the question, "Where did the customer get his telephone number for the last call he made?" About two-thirds of the numbers called by residence customers come from the customer's memory, with slightly more reliance on memory in the large cities than in the small cities. Personal number lists furnish 14 per cent of the numbers in small cities and about 22 per cent in the large cities. Of course, the numbers must come from some other source originally, and it is very likely the directory is one of the most important primary sources.

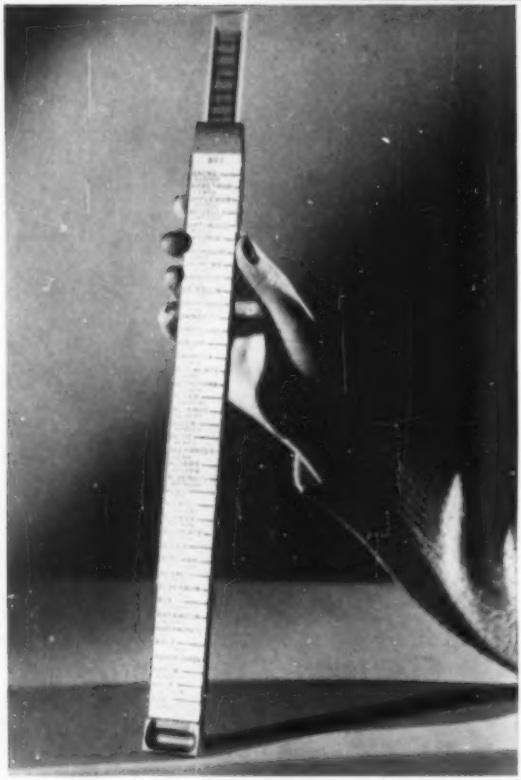
The survey also showed that the size of the alphabetical list in the directory had a relation to the use of the directory. The bigger the alphabetical list, the less the directory is used as a number source.

Customers who use the directory less do not necessarily call information more, but rely more upon their memory and upon their own personal number lists.

These survey results pointed out that some accomplishment in controlling direc-



A micro-printed record is tried as a solution to the bulk problem. The micro-prints at the left are projected on the screen in front of the operator.



Another solution to the problem of bulk is the micro-film record and position now being tried.

tory size or, more properly speaking, the size of the alphabetical list in the directory, would make the directory more useful for customers, and perhaps could reduce printing costs by reducing the number of printed pages.

Experience has shown that geographical breakdowns, such as city and suburban directories, where the areas can be defined, are excellent solutions. The areas some directories cover are being studied to be sure they include the customer's area of interest but not too much area that he does not call. Separate town alphabetical lists in a directory covering several towns makes the directory easier to use for both the customer and operator by keeping the alphabetical lists smaller. For example, in a single town there may be only twenty Smiths, but if all the towns were lumped into a single alphabetical list, there may be a full page of Smiths to look through before finding the one wanted. Incidentally, the surveys show that better than nine out of ten customers know the town they are calling, particularly when town limits are generally known or can be easily defined.

Of course, where towns tend to run together, as in metropolitan suburban areas, and the boundaries between towns become difficult to recognize, the large single alphabetical list may be the best arrangement for both the customer and the Information operator.

Some other ideas for making directories smaller and more convenient to use have been considered, such as a separate business and a separate residence directory. In addition, most large directories are being changed to two-letter listings such as RE 7-1212, with a simple cross-reference to the respective office names, in place of the former REgent 7-1212. This saves space by cutting down two-line listings and in some cases allows the use of another column of listings, with about a 20 per cent saving in pages.

Other Developments

THE INFORMATION OPERATORS in some of the larger cities have been experimenting with quoting the two letters instead of the office name to the customers, giving them only the information they need to know to dial. This seems to help customer dialing because he doesn't have to spell difficult names like HYacinth, ULysses, etc., and wonder what the first two letters are. Just another attempt to explore and improve on our methods.

Of course, we will continue to give out Blue Books of telephone numbers and promote their use. When the customer gets the personal number list habit, he has it for life, the study shows. Very few ever give up the personal number list habit, whether it is a list written on the wall by the telephone, in the Blue Book, or in a fancy leather-bound book of his own choosing. Whatever form it takes, the customer wants his personal number list handy, and well he should, for it serves as a quick reference for the fifty or so numbers he generally keeps in it.

We will continue to try to make the customer aware that his telephone number is an important part of his address just as his street number is. The telephone number on business cards, letterheads, bills, and invoices can be an important factor in good business relations. And as time goes on, it is increasingly important for the customer to realize that the numbering area code is becoming a basic part of the telephone number not only when calling people in other numbering areas but when publicizing his own telephone number in distant places.

Fast communication today depends

Customers want directories, but they are getting more and more bulky and awkward to use.

more than ever on having the called telephone number or having a quick, easy-to-use reference source, whether it be an operator, a directory, a personal number list, or a good memory. In considering the problems of number services over the next half century, one area not yet fully explored is the customer's memory, and there are some challenging questions needing answers here. Such questions are being asked as, "Is memory helped by the use of office names or can customers more easily remember just two letters and five numerals?" and "Can customers remember seven digits better when they are grouped in 3-4 grouping, or in 3-2-2 or 2-3-2 grouping? In fact, the question of memory span, using seven or more numerals and no names or letters, is under exploration. These questions and many more like them must be searched out and—who knows?—your telephone number in the future might be listed as PL-322-12 or 753-22-12 because it possibly could be remembered easiest that way.

We have been growing, and accumulating some of these problems, for eighty years and we won't solve them all tomorrow. We have made a good start by outlining our problems more clearly. A lot of competent research and administrative ability must be brought to bear on these problems in number services and they are commanding increasing attention at A. T. & T., the Bell Laboratories and the Associated Companies. We now have a guide and a direction in the Task Force report, and are making some real progress in our study of number services. As a telephone user, your service over the years in subtle ways, or perhaps in some radical ways, will be affected by the work that is now under way.

Western Electric engineers find better, faster, cheaper ways of producing the tools of telephony and putting them into the hands that use them

ENGINEERS OF PROGRESS

A picture story prepared by

DAVID F. ROBINSON

PUBLIC RELATIONS ORGANIZATION, WESTERN ELECTRIC COMPANY

TELEPHONY is a hungry science. It feeds and grows on a diet of ideas, brought to fruition by inventive engineers, and the more it is fed, the hungrier it becomes.

Among those who feed this ravenous appetite are the engineers of Western Electric. Their job is to find better ways, faster ways, cheaper ways of producing telephone equipment and putting it into the hands that use it.

In the course of meeting this challenge, many seedling ideas are produced. Some of these perish under the cold light of careful scrutiny and experimentation. But many others mature and bear fruit, and the harvest is measured in terms of lower costs, more efficient methods, and more dependable products.

Here, in words and pictures, is a sampling of the current crop.

Although it looks like a washing machine and might do a good job of spin-drying a load of wet wash, the function of this recently-developed centrifuge is to squeeze air bubbles out of the hot wax that has gone into wax-filled capacitors. Inside the whirling centrifuge, the wax is crammed into the capacitor cans with a force of 240 times its normal weight, and the air bubbles, which sometimes shortened product life and were previously costly to eliminate, are forced out in a matter of moments. The process has the added advantage of eliminating the pesky, costly job of cleaning hardened wax off the outside of the capacitor cans: while still soft, the wax simply flies off.

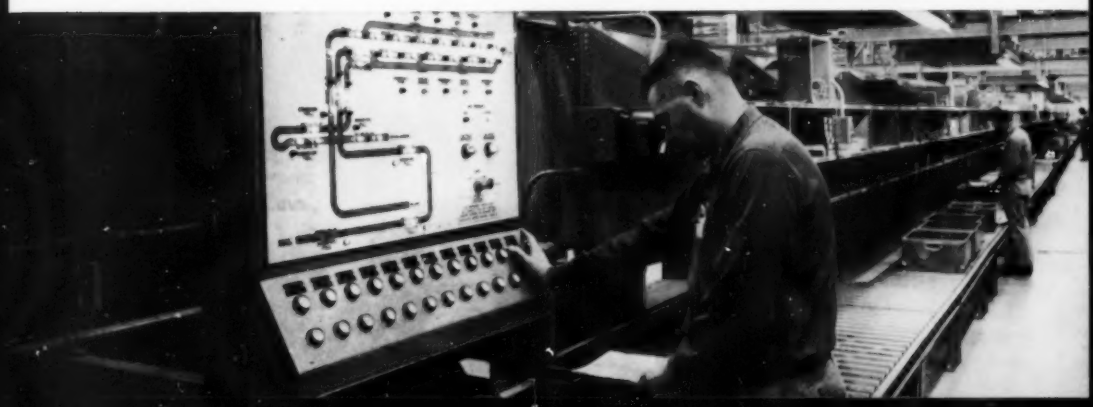
1959

Here's a recipe definitely not recommended for today's modern homemaker: take a measure of sand, immerse in a lye solution, add a few fragments of crushed quartz, and let it cook for about a month under pressure of about 24,000 pounds per square inch. This, in a nutshell, is the quantity production method devised by Western and Bell Laboratories engineers for growing crystals of quartz for use in many phases of telephony. Although quartz is a common mineral, natural crystals of suitable quality are scarce, and hence expensive and not always in adequate supply. Through this process, Western's engineers have not only cut the cost of this raw material but have bested Mother Nature as well by producing crystals which are superior in physical quality to their natural counterparts.

When a product must be moved about or stored between steps in its manufacture, time and money are lost. With this in mind, Western's engineers set out to tandemize the machinery used in the manufacture of small wire for certain cables, so that the product would move smoothly through several processes without interruption, storage, or handling. Far from being a simple matter of hitching up the machines end-to-end, this concept demanded the solution of complex problems of machine design and synchronization at every step of the process. Western's answers to these problems are in this equipment, which draws the wire to proper size, heat treats it, covers it with plastic insulation, tests it electrically, and winds it on reels in a continuous flow of production — all at the rate of about 2,200 feet a minute.

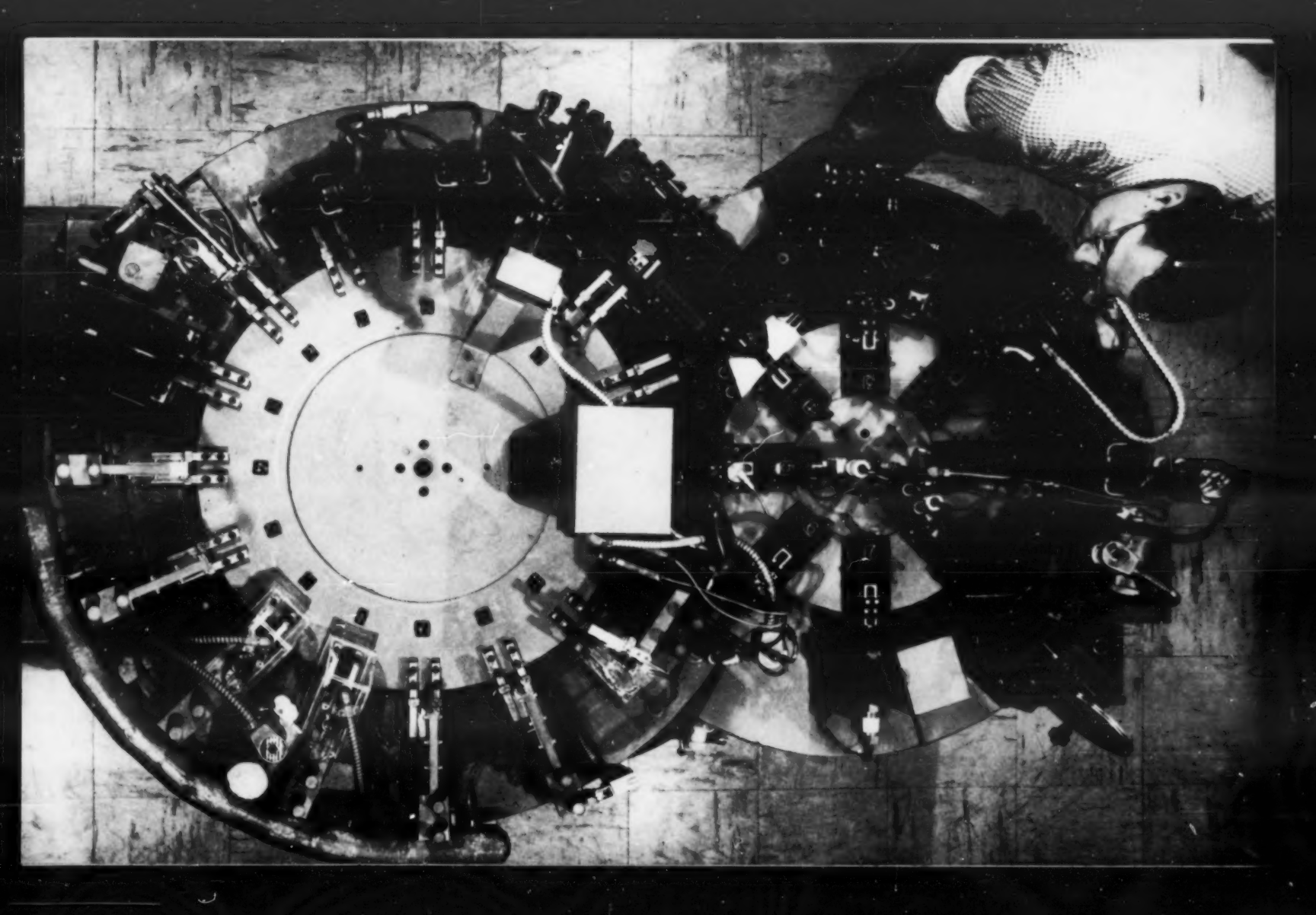
A perplexing problem in the assembly of miniature electron tubes is the insertion by hand of a tiny ceramic-encased coil of wire, called the heater, into the cathode sleeve. Even a minute crack in the fragile heater coating means a rejection, and the task of inserting it by hand was on the borderline of human capability. Western Electric engineers tackled the problem and came up with the idea of using vacuum apparatus to supply a stream of air that would literally suck the minuscule heater into place. In addition to making the job easier, the happy result of this miscroscopic drama is a marked decrease in rejects, which in turn means a significant cost reduction.

One way to cut the cost of an item is to reduce the amount of time, space, and effort required to move it from the point of manufacture to the point of use. A key facility in Western Electric's handling and delivery sequence is the distributing house, where thousands of items are held ready for prompt shipment to Bell telephone companies. Engineering advances in the science of distribution, such as this centrally-controlled conveyor for selecting from "broken packages" at one of Western's 32 distributing houses, have helped to increase warehousing efficiency by 25% during the last ten years.

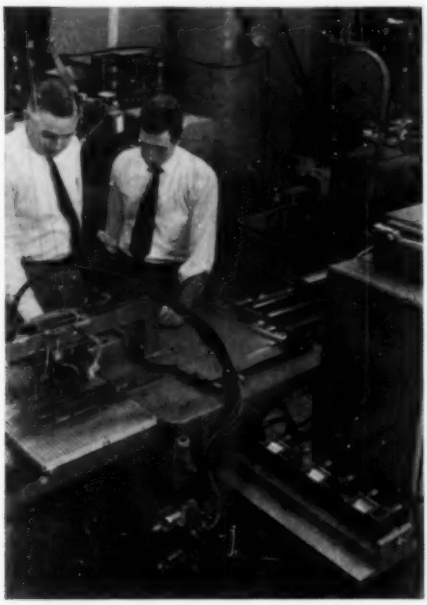


It may soon be possible for telephone companies to order their supplies from Western — as they do at the rate of about a half million large and small orders a month — by simply feeding the information about each order directly into an electronic brain at the distributing house, without the clerical effort and mailing time which normally intervene. A remote data input system recently developed by engineers of Western's Distribution Organization and Bell Laboratories incorporates the compact device being operated by the telephone man above, which can "read" punched cards and transmit their information over regular telephone circuits by means of Dataphone service to data processing equipment half a block or half a continent away. After inserting an identification card, the telephone man has only to feed in a card corresponding to each item he wants and press numbered keys for the quantity he needs, and the transaction is processed to completion automatically and error free.

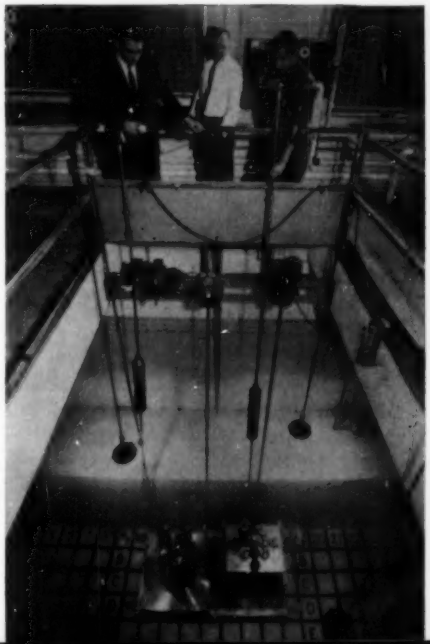
Realizing that savings could be achieved if the job of attaching electronic components to printed wiring boards could be mechanized, Western Electric engineers developed first a model (inset) and then an experimental tape-controlled machine to do the job. From a forest of vertical hoppers, the various components are picked up by a rotating transfer arm, delivered to an insertion mechanism, and neatly plunked into place. The machine can assemble components on boards of many different sizes and designs.



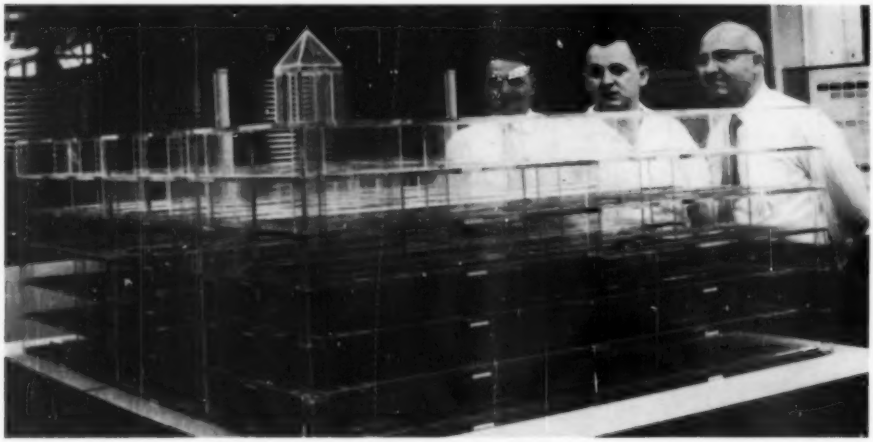
Automated production of transistors for the Bell System has been brought a step closer to reality through the development of this prototype machine by Western's engineers. The machine automatically assembles junction transistors under its own complex control – a process normally requiring costly hand operations – thus pointing the way to high volume production of transistors at lower and lower cost. Although the machine was engineered to produce a breed of transistor which is now being replaced by other types, the value of its development is preserved in the experience and confidence gained by Western's engineers in overcoming some of the problems posed by the thimble-small size of the product and the precision required.



Even the atom itself is being scrutinized by Western's engineers in their search for a better way to do the job. Under President Eisenhower's "Atoms For Peace" program, research tools such as this "swimming pool" irradiation facility at the Argonne National Laboratory near Chicago have been utilized for experimentation. At the bottom of a 24-foot pool of clear water, samples of materials used in the manufacture of telephones are being maneuvered into position for an hour's bombardment by high-speed gamma radiation. Resultant changes in the molecular structure of the samples may lead to such developments as more weather-resistant plastics or new methods of "curing" plastic by atomic radiation.



Local cable, the complex wiring network for switching equipment, looms large in the eyes of Western's engineers as an area for cost reduction effort, since each cable-forming job has its own pattern and requires many man-hours to perform. An answer to the problem may lie in this experimental cable-forming machine which positions the wires in the desired pattern under the guidance of a punched-tape control system. An automatic process such as this should substantially reduce the effort normally required in making local cable.



As engineering skill produces technological advances, more engineering skill must be applied to the job of reaping the fruits of these advances. Here you're looking through a lucite model of Western Electric's Hawthorne Works in Chicago, where modernization work is currently under way. Engineers are using the model in developing plans which call for straight line production flow, now typical of Western's new plants.

And where will tomorrow's engineering advances come from? Many will doubtless be born in Western Electric's new Engineering Research Center near Princeton, New Jersey, where basic research will be conducted in the areas of machines, materials, and computer applications. In this temporary building and the new laboratory buildings scheduled for construction; in distributing houses and installation offices; and in plants, shops, and offices throughout Western Electric, engineering achievements will continue to flow from the minds of creative engineers.

The United States and Canada together have nearly three-fifths of all the telephones in the world

A STATISTICIAN LOOKS AT THE WORLD'S TELEPHONES

ELIZABETH WRENSHALL

CHIEF STATISTICIAN'S DIVISION, COMPTROLLER'S DEPARTMENT, A. T. & T. CO.

WE IN THE United States can pick up our telephone and call almost any other telephone anywhere. About 114 million telephones, or 97 per cent of the world total, are within reach. A vacation in Europe, a house for retirement in Mexico or the Virgin Islands, or plans for an extended stay in other distant places are contemplated with an easier frame of mind than used to be the case, for we can keep in touch with home wherever we may be. Telephone facilities are constantly being improved, service extended, and usage increased.

The most recent issue of "The World's Telephones," the booklet issued annually by the Chief Statistician's Division of the A. T. & T. Company, shows that there were more than four telephones, on the average, for every 100 persons in the world at the beginning of 1958. The average number of conversations per person during 1957 was 56, as compared with 51 in the preceding year. These figures may not seem very impressive, but it should be remembered that they include many people who have no concept whatever of a telephone: people who inhabit the Livingstone country in Africa, the Kipling country in India, the "King and I" country in Thailand, Stevenson's Samoa and Lawrence's Arabia, Tibetans and Nepalese who shun the ways of the western world.

Continental Areas

THE TABLE on page 44 gives an idea of telephone distribution for the earth's large land masses.

ASIA, land of superlatives, with the wettest, the dryest, the lowest and the highest spots on earth, home to half of the world's people, has only six million telephones or about as many as there are in the two cities of New York and Chicago combined; and one country, Japan, has more than half of them. India has the next largest number with 335,000, and is currently in the process of enlarging its system. China last reported figures ten years ago, at which time they had 244,000 telephones. Subsequent growth is unknown.

AFRICA is the second-largest of the

TELEPHONES IN CONTINENTAL AREAS

January 1, 1958

Area	Total			Privately Operated		Automatic		Connecting with Bell System	
	Number	Per Cent of Total World	Per 100 Population	Number	Per Cent of Total Tels.	Number	Per Cent of Total Tels.	Number	Per Cent of Total Tels.
North America	68,470,600	58.1	36.1	67,737,200	98.9	60,736,500	88.7	68,457,800	100.0(1)
Middle America	835,900	0.7	1.3	753,600	90.2	651,100	77.9	824,900	98.7
South America	2,845,000	2.4	2.2	1,360,600	47.8	2,372,800	83.4	2,748,300	96.6
Europe	35,231,900	29.9	6.3	5,695,600	16.2	28,266,800	80.2	33,432,200	94.9
Africa	1,663,200	1.4	0.7	31,200	1.9	1,180,700	71.0	1,483,300	89.2
Asia	6,062,700	5.2	0.4	3,930,700	64.8	3,702,000	61.1	4,672,100	77.1
Oceania	2,690,700	2.3	17.4	193,400	7.2	1,929,600	71.7	2,681,400	99.7
World	117,800,000	100.0	4.2	79,702,300	67.7	98,839,500	83.9	114,300,000	97.0
United States	*63,620,863*	*54.0*	*36.8*	*63,620,863*	*100.0*	*56,862,520*	*89.4*	*63,618,072*	*100.0(1)*

(1) Virtually all connect.

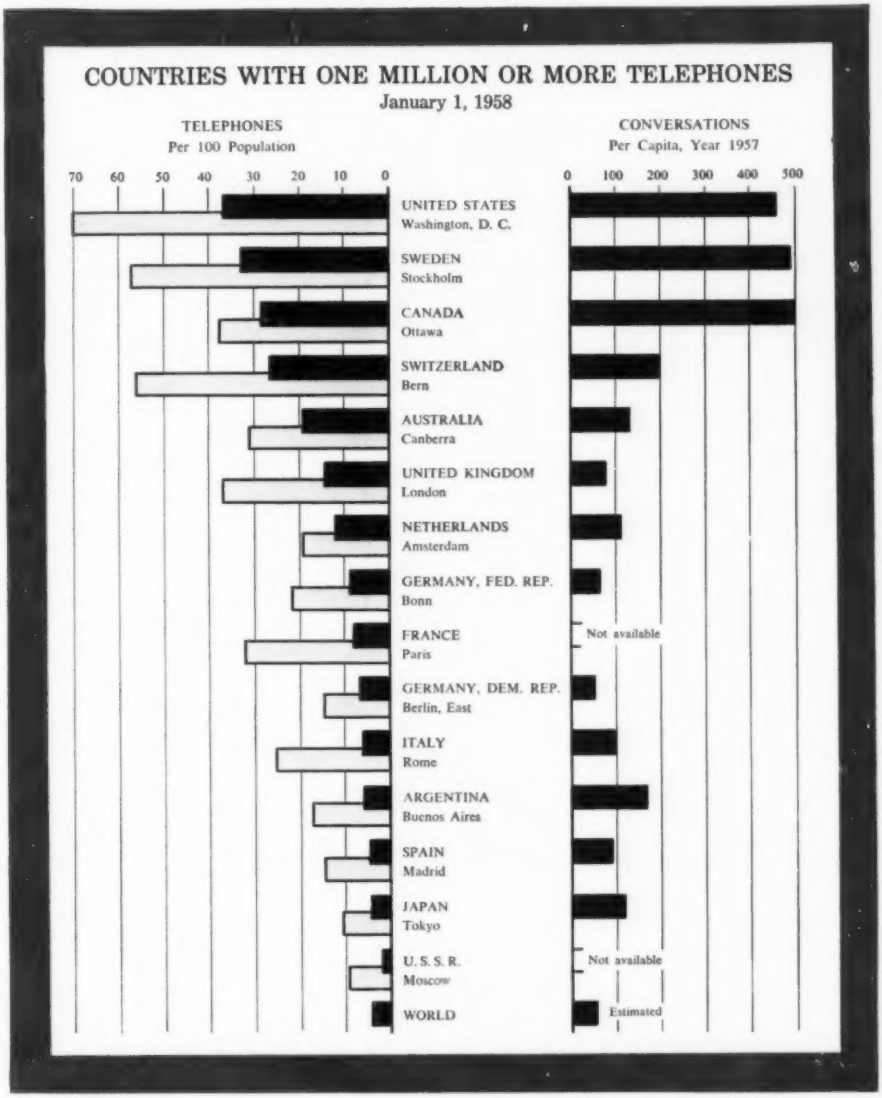
continental areas—a giant being aroused from sleep by modern communication and transportation methods. Radiotelephony and the airplane have conquered the deserts and mountains, the falls and rapids and thick forests that impeded trade between the north and the south until fairly recently. Africa still has fewer than two million telephones, but ten years ago it had little more than half a million. Half of the continent's telephones are located in the Union of South Africa. A large proportion of the others are in the countries along the north coast. In addition to the telephones counted for the purpose of this report, Africa has many private line systems that are kept busy by the mines, plantations, and industries they serve.

NORTH AMERICA is nature's favored child. Its location has given it varied and favorable climate, inland waterways for transportation and power, great natural resources, accessibility to world markets. A high standard of living has enabled us to have many conveniences, among them the telephone. The telephone has made it possible to conduct thousands of businesses in compact skyscrapers. It has enabled us to live in sparsely inhabited communities by providing protection against the hazards of isolation. The United States and its good northern neighbor, Canada, have nearly three-fifths of all the world's telephones. The United States alone accounts for more than half of the world total.

SOUTH AMERICA'S location and climate have made much of its area unfavorable to man. The same chain of mountains that run the length of North America rise to formidable height in the Andes, to a peak of 23,000 feet, the highest in the Americas, continuing in long snow-capped ranges. Two-thirds of South America lies in the tropics, where humidity and swamps have discouraged development. In spite of nature's impediments in parts of the continent, South America boasts some of the most beautiful and modern cities that civilization has produced. Rapid strides in industrial activity have been made in this continent, too, since the advent of modern communications and transportation. Barriers impracticable to cross by cable are conquered by radiotelephone. Commercial

planes carry passengers and cargo over the difficult terrain. Argentina has more than a million telephones and Brazil almost a million, while some of the smaller countries are busily integrating and expanding their systems.

EUROPE, with its dense population, has a great variety of languages and customs. Itself a peninsula, it is a continent with many peninsulas, and the irregular coastline with its deep indentations has contributed to the development of numer-



COUNTRIES WITH ONE MILLION OR MORE TELEPHONES

January 1, 1958

Country	Total						Automatic	
	Number			Per Cent Increase		Per 100 Population	Number	Per Cent of Total
	1958	1957	1948	1958 over 1957	1958 over 1948	1958	1958	
Argentina	1,181,121	1,155,198	651,106	2.2	81.4	5.89	980,463	83.0
Australia	1,873,791	1,762,173	936,164	6.3	100.2	19.22	1,330,398	71.0
Canada	4,816,118	4,499,325	2,230,597	7.0	115.9	28.64	3,846,095	79.9
France	3,498,900	3,313,426	2,108,140	5.6	66.0	7.92	2,537,347	72.5
Germany, Dem. Rep.	1,123,278	1,066,582	(1)	5.3	(1)	6.45	1,039,032	92.5
Germany, Fed. Rep.	4,731,945	4,323,225	1,741,000	9.5	171.8	8.75	4,624,595	97.7
Italy	2,871,011	2,609,127	931,907	10.0	208.1	5.91	2,756,691	96.0
Japan (2)	3,886,327	3,486,821	1,195,238	11.5	225.2	4.22	2,356,883	60.6
Netherlands	1,318,269	1,229,174	554,000	7.2	138.0	11.88	1,277,996	96.9
Spain	1,339,653	1,199,078	509,808	11.7	162.8	4.51	1,053,575	78.6
Sweden	2,409,842	2,312,223	1,425,544	4.2	69.0	32.60	1,975,315	82.0
Switzerland	1,385,125	1,293,743	744,997	7.1	85.9	26.84	1,380,330	99.7
U. S. S. R.	3,558,000	3,366,000	(1)	5.7	(1)	1.78	1,640,000	46.1
United Kingdom (2)	7,354,000	7,218,791	4,631,200	1.9	58.8	14.25	5,822,900	79.2
United States	63,620,900	60,190,400	34,866,800	5.7	82.5	36.82	56,862,500	89.4

Country	Total							
	Main		Extension and Private Branch Exchange		Residence		Business	
	Number	Per Cent of Total	Number	Per Cent of Total	Number	Per Cent of Total	Number	Per Cent of Total
Argentina	850,162	72.0	330,959	28.0	568,408	48.1	612,713	51.9
Australia	1,399,692	74.7	474,099	25.3	494,180	26.4	1,379,611	73.6
Canada	3,682,625	76.5	1,133,493	23.5	3,409,810	70.8	1,406,308	29.2
France	2,005,838	57.3	1,493,062	42.7	(1)	(1)	(1)	(1)
Germany, Dem. Rep.	533,989	47.5	589,289	52.5	(1)	(1)	(1)	(1)
Germany, Fed. Rep.	2,551,751	53.9	2,180,194	46.1	(1)	(1)	(1)	(1)
Italy	2,259,676	78.7	611,335	21.3	1,413,528	49.2	1,457,483	50.8
Japan (2)	2,552,713	65.7	1,333,614	34.3	365,555	9.4	3,520,772	90.6
Netherlands	857,158	65.0	461,111	35.0	(1)	(1)	(1)	(1)
Spain	915,593	68.3	424,060	31.7	339,408	25.3	1,000,245	74.7
Sweden	1,919,455	79.7	490,387	20.3	1,740,000	72.2	669,842	27.8
Switzerland	909,021	65.6	476,104	34.4	457,091	33.0	928,034	67.0
U.S.S.R.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
United Kingdom (2)	4,465,000	60.7	2,889,000	39.3	2,990,000	40.7	4,364,000	59.3
United States	44,597,100	70.1	19,023,800	29.9	45,460,200	71.5	18,160,700	28.5

ous individual nations. The northern peninsulas, with Sweden, Norway, Finland and Denmark, contain highly developed telephone systems. Sweden is second only to the United States in telephone development, with 33 per 100 of the population as compared with 37 for the United States. The United Kingdom, with 7,354,000 telephones, ranks second in point of absolute numbers, the United States being first with 63,621,000 (66,630,000 at the beginning of 1959). The German Federal Republic

(Western Germany), through its remarkable postwar reconstruction, has Europe's second-largest system, with 4,732,000 telephones.

OCEANIA is a continent of islands, one of which is Australia, the world's largest island. Australia has close to two million telephones. Hawaii, New Zealand, and Australia rank among the top ten places of the world as regards telephone development.

MIDDLE AMERICA groups together Central America, Mexico, the islands of the Caribbean Sea, and other islands of the general area. Mexico has the largest telephone system with more than 400,000 telephones, and Cuba's system ranks second in size. The Canal Zone has the highest telephone density within this grouping, followed by Bermuda and the Virgin Islands.

Countries with a Million or More Telephones

FIFTEEN COUNTRIES have a million or more telephones, as compared with seven countries ten years ago. It will be seen in the table on the opposite page that the largest percentage increase in growth occurred in those countries that have the lowest number of telephones per 100 population: the German Federal Republic, Italy, Japan, and Spain. Telephone density ranged from 2 per 100 inhabitants in the U.S.S.R. to 37 in the United States. Switzerland reported the highest automatic development, with 99.7 per cent.

Figures for the subdivision of total telephones into business and residence were not supplied for all countries. This is due to the fact that some telephone administrations make no rate distinction between the two types of service, and these statistics are not maintained. Of those countries reporting such statistics, it may be noted that Japan and Spain, with low telephone development, have a large proportion of their telephones in business establishments. The two countries with the highest development, the United States and Sweden, on the other hand, report more than 70 per cent in residence service. This pattern is not followed consistently, however, for Australia and Switzerland each have high telephone densities, yet have roughly 70 per cent of the total in business telephones.

As is shown in the accompanying chart, Washington, D. C., has more telephones in proportion to population than any other city. New York, with 4,204,000 telephones, has far more than any other city and more than most countries. London has more telephones than any other city outside the United States.

The foregoing contains some of the statistics listed in "The World's Telephones." A copy of the booklet may be obtained on request through the Public Relations Department of the American Telephone and Telegraph Company.

One Company finds many advantages in a "PCR" program which enables men to discuss telephone matters with people they meet on the job

HELPING PLANT MEN TO MEET CUSTOMERS KNOWLEDGEABLY

M. L. HAMMER

Acting Area Information Manager—Missouri-Illinois, PUBLIC RELATIONS DEPARTMENT, SOUTHWESTERN BELL TELEPHONE COMPANY

Note: This article gives a first-hand account of how one Bell Company is meeting a problem which it is not alone in facing.
EDITOR.

"PEOPLE HERE may be interested in the DEW line," a Harlingen, Texas, installer observed, "but that's not what they ask me about. They're more interested in what Southwestern Bell is going to do with the lot we bought downtown."

What we're going to do with that lot . . . why we ask new customers for deposits . . . our policy on moving color telephones —these are the kind of answers Southwestern Bell employees say they want and need to do a good job of dealing with customers.

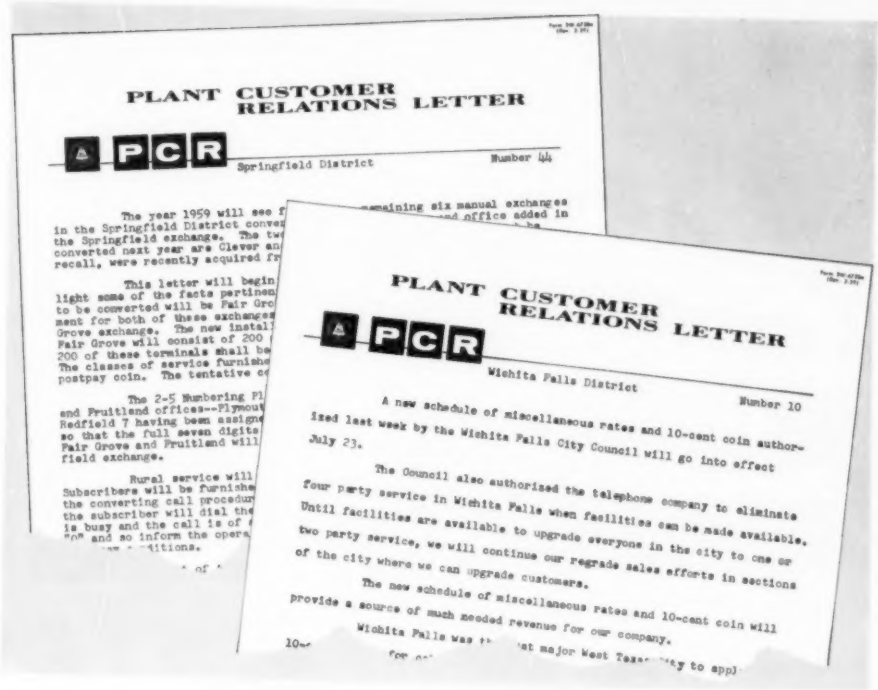
A good public relations program supplies employees with answers of this kind. Employees are interested in what's happening right around them—in their town or district, and have the greatest need for this kind of information. Armed with such knowledge, they can answer customers' questions. They can talk about many telephone subjects of interest. They can ward off rumors and clear up misunderstandings.

Every telephone employee is an ambassador—good, bad, or mediocre. How well informed he is on local operations can have a great bearing on what kind of ambassador he is. This is the foundation of Southwestern's Plant Customer Relations program.

The PCR program is designed to give Plant men local material they can use to answer questions and to discuss telephone plans, problems or events. The end product: more satisfied customers, more efficient employees.

The program is simple. This is the way it works.

The district plant superintendent writes a weekly letter to his foremen. There are three guides for picking a subject. The letter should answer a question customers are asking, or deal with some aspect of customer relations, or give background for talking with the public.



PLANT CUSTOMER RELATIONS LETTER

PCR

Springfield District

Number 44

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PLANT CUSTOMER RELATIONS LETTER

PCR

Wichita Falls District

Number 10

A new schedule of miscellaneous rates and 10-cent coin author-
ized last week by the Wichita Falls City Council will go into effect
July 23.

The Council also authorized the telephone company to eliminate
four party service in Wichita Falls when facilities can be made available.
Until facilities are available to upgrade everyone in the city to one or
two party service, we will continue our regrade sales efforts in sections
of the city where we can upgrade customers.

The new schedule of miscellaneous rates and 10-cent coin will
provide a source of much needed revenue for our company.

Wichita Falls was th
10-
for

Two of the more than 8000 weekly PCR letters written by district plant superintendents in the past three years

Of course, there's one broad rule. The letter should be localized to the district or an exchange within the district.

The foreman reads the letter, then holds a 10- to 20-minute "tail-gate" discussion of its subject with his men.

More than 8,000 letters have been written in the past three years by district plant superintendents. Letter subjects come from all departments: number changes, dial and direct distance dialing, local construction, why customer deposits are required, the policy on moving color telephones, traffic practice changes that affect the customer. Some letters cover subjects in one paragraph. Others take a page or more. Long letters, however, are discouraged.

Benefits are Many and Varied

WHILE the program seeks mainly to increase public relations value in Plant contacts, there are other benefits. The program helps improve interdepartmental understanding and coöperation. Letters frequently deal with happenings in other departments.

For example, when the Traffic Department recently changed its practice on call-backs on long distance calls, Plant men were told about the change and why it was made. Plant men learned more about the Traffic Department and its problems. They also were able to talk with customers about the change.

The very fact that other departments

How a PCR letter originates

are called upon to provide material helps build teamwork. Plant Customer Relations Letters are also used in many locations by other departments. Commercial people circulate them and the Traffic Department covers them in morning meetings.

There's no doubt that the letters increase the flow of local information. Staff people above the district level would have a hard time gathering and distributing the thousands of pieces of valuable local information available in each district.

There is still another important benefit. The PCR program helps lay a good foundation for a sales effort. The fundamentals of the program—good manners, properly meeting the customer, conducting oneself well on the customer's premises—are useful preliminaries in selling.

There are many other by-products. For example, Plant men are in a position to answer routine questions which otherwise would result in calls to business offices.

These benefits are important particularly when multiplied by the four million customer contacts made each year by Southwestern Plant men. The number of contacts continues to grow and Plant forces gain more and more recognition as a potent customer contact group—a position once held almost exclusively by the Commercial Department.

How the PCR Program Originated

THE Plant Customer Relations Program didn't develop over night. First indication of a need for some sort of a plan came from the Plant men themselves. They said customers were looking to them more for answers to questions—questions they couldn't answer or were finding hard to answer. They said they needed information about telephone plans and activities in their own towns and districts. With this, they said,

they could answer questions and discuss problems.

Thus came the plan for the Plant Customers Relations Program.

To lay a good foundation, day-long customer relations training classes were conducted for Plant contact people at the outset of the program in 1956.

The men discussed such things as: What is customer relations? Why is the company concerned about it? Where do I fit into the picture and how will it benefit me? They developed things they could do to help build good customer relations. They covered hundreds of approaches—from road courtesy to answering questions and discussing telephone problems with customers.

Similar training was later given to inside Plant forces, and in 1957 a refresher training course was conducted for all Plant line people. We'll have another training course this year to refresh the men in the fundamentals and to further stimulate customer relations consciousness.

On the heels of the formal training courses in 1956 came the PCR letters—the backbone of the program. The formal training emphasized the need for maintaining good customer relations. The letters arm the Plant men in their effort to maintain good customer relations.

The Program is Endorsed—and Used

THERE IS no measurement on PCR letters, but they are increasing. At the start of the program, 62 per cent of the possible number of letters were written. In the three-year period, the number of letters has moved ahead rapidly to where today 90 per cent of the total possible number are issued.

The fact that letters are being written and discussed in "tail-gate" meetings doesn't mean that the program is doing a

A foreman discusses a PCR letter with his men

A plant craftsman is enabled to explain a telephone matter to a customer

job. It simply means that it is functioning as it should. Real proof of the value is in what the men themselves say about the program.

I've talked with 200 or more Plant men and 100 or so people in other departments at all levels in 40 of our 71 Plant districts.

There's no doubt about the verdict. The program is of value to them. Many craft people are enthusiastic. Others say they appreciate the information and make use of it.

This is what one installer in Oklahoma City told me: "The letters are definitely good. You can't get too much information when you're working among customers in their homes all day long." All up and down the line, from McAllen, Texas, to Kansas City, Mo., similar thoughts were expressed: "Of course I make use of the material." "We need everything we can get in the way of information." "We should have had something like this 20 years ago."

Inside forces who face the public mostly after working hours do not have as strong a feeling as the outside group. But effect of the program has appeared in some unexpected places among inside men. For example, a building superintendent at San Antonio, Texas, has this to say:

"People in my group could be working in any building in town so far as their jobs are concerned, but the Plant letters give us a feeling of belonging to the telephone company."

There have been some other unanticipated reactions to the program. Craft people in many towns have told me in so many words that because of the letters they feel the company is doing its best to keep them informed, that they feel they are more a part of the company, and that the company is trying to help them get ahead in their jobs.

First- and second-line Plant supervisors who not only supply material for letters but also conduct the weekly discussions with their men feel the program is well worth the 10 to 20 minutes required each week. Many have admitted that they have learned a good deal themselves through the letters.

Supervisors Like It

PERHAPS the best testimonial from this group came from a supervising installation foreman in a St. Louis, Mo., district who told me:

"You'd have to work with these men regularly to notice the change. The letters have raised morale, changed attitude, and generally encouraged the men to think along sound lines. With the information they have received, they can piece together bits of information from various letters and answer questions that have never been directly covered in letters. I know; I've seen this very thing done."

District men, who carry the burden of the program, consider the program "a valuable tool in running the district." It has been referred to by many as the best

channel of communication with the men.

The Amarillo, Texas, district plant superintendent, a veteran Plant man, is a strong advocate of the PCR program. He has personal reasons.

"I remember," he said, "my first weeks with the telephone company. About all I knew about the company then, and for quite a while after, was where to report for work the next morning. Could you imagine running the business like that now?

But the best salesmen for the PCR program continue to be the craft people and their foremen.

A good example of this occurred during a tour of one Texas division last Summer. I was accompanied by a visitor, who was interested in the program from a System standpoint. I hoped, of course, that his impression would be favorable.

At our first stop of the week, the district plant superintendent just about exploded my hopes with: "I think it's time we stopped this program. We've covered a lot of territory, and I can't believe more letters would be helpful."

I suggested we ask his men what they thought. He agreed, and for the next eight hours we went from garage to garage talking to first- and second-line foremen, installers and repairmen.

We heard nothing but encouraging words from the men—such things as "Let's don't stop the letters now, they are helpful," and "We'll take all the information you can give us."

Back in the parking lot at the end of the day, the district man volunteered that he had "grossly under-estimated the effect of the program" and that he'd better get busy on it.

The visitor did get a good impression of the program. And it came from the best possible source—the men themselves.

PCR's Value to Our Business

THE ULTIMATE value of the PCR program to the business is staggering, particularly when it is related to the public relations aspects. Right now, Southwestern Plant men make almost four million face-to-face contacts a year with our customers. These are by appointment. A lot of things ride on how these men conduct themselves and treat the customer. The sum total is called customer attitude.

We can't anticipate what each man will need in meeting each customer. We can't guarantee that each contact will be made satisfactorily. We can, however, help the Plant men become aware of the fact that there is a customer attitude, and that there is a need to make that attitude a good one. We can give the men information they can use to answer questions, discuss customer problems, meet situations, and conduct themselves to the best interests of the company—and the customer.

The Plant Customer Relations Program helps to do those things.

Who's Who & What's What

(Continued from page 3)

Elizabeth Wrenshall

that she was a teacher in schools abroad before World War II and a translator for censorship authorities during that struggle. In the chief statistician's division of the Comptroller's Department of A. T. & T. since 1945, Miss Wrenshall's ability with foreign tongues has been a great asset in gathering and compiling the data which she uses in her daily activities.

David F. Robinson

M. L. Hammer

AFTER SEVERAL YEARS on a number of newspapers in the southwest as a reporter and editor, M. L. HAMMER joined the Southwestern Bell Telephone Company as an advertising assistant in 1952. He has held various positions at headquarters of the General Information Department and in the Missouri-Illinois area information organization and, on February 16, assumed his present position of acting area information manager for the Missouri-Illinois area.

HEADQUARTERS SUMMARY

December 15, 1958, to March 15, 1959

RECORDED INTERCEPT machines have been installed in approximately 160 cities. They serve over 24 million telephones, which originate more than half of all Bell System calls. Calls reaching a vacant or disconnected telephone number are routed directly to a recorded announcement instead of to the intercept operator. If the customer does not hang up after one or two announcements, he is then connected with the intercept operator. Calls reaching a telephone number which has been recently changed are routed immediately to the intercept operator. Savings in intercept operating expense with the use of intercept recording machines are substantial.

Good service to the customer is protected by stating in the announcement that if the customer needs assistance he may stay on the line and an operator will answer. This is very desirable because nearly a third of the calls reaching the announcement machine reach there in error, mostly because customers have dialed incorrectly.

THE NEW JERSEY COMPANY will conduct in New Brunswick during 1959 a product trial of the latest design of a dial-in-handset telephone. This model differs from the earlier one in that the dial is located in the center of the handset, rather than superimposed on the transmitter. It will have the additional feature of a dial night lite, the control switch for which will be located in the newly designed low silhouetted base.

Using non-operative models for the first part of the trial, interviews will be made in February with approximately 200 customers to determine their reaction to the design, appearance and handling aspects of the telephone. In June, 250 working models will be available for a product test as the second part of the trial. Installations at no charge will be made in the homes of residence customers and also with a small sample of business customers.

During the product testing period, Bell Laboratories will conduct appraisals to determine customer performance with the equipment. Near the end of the trial, users will be interviewed to determine their general reaction to and experience with the instrument.

THE TJ RADIO SYSTEM, which became available last year for short haul service, is already demonstrating its versatility in providing telephone and SAGE data circuits. Five systems are now in service in the C&P-Virginia, Mountain States (2 systems), Pacific, and Southern Companies. Other systems are being installed in Colorado, Michigan, Minnesota and Mississippi.

The shortest system now in service is one hop, 11 miles, between Los Angeles and Compton, Cal., carrying 360 circuits. This is an unusual application of short haul microwave in view of the short distance and its location within a large metropolitan area. Because of the broadband characteristic of TJ and the single hop, it is expected that this system will be loaded to 600 circuits on one radio channel or 1800 on the three channels available. Another unusual application of TJ is a single 23-mile hop now providing SAGE facilities across lower Chesapeake Bay. This is the first attempt to operate a long over-water hop in the 11,000 mc frequency band. Such systems have been operated, where feasible, in the 900 mc band until it was allocated to Government service last year. The longest present system is 5 hops, 138 miles, which provides 48 circuits between Phoenix and Flagstaff, Arizona.

CONSIDERABLE PROGRESS has been made in the introduction of operator mark sensing of toll tickets since the program was started in January 1958 at Woonsocket, R. I. During the past year, mark sensing has been introduced in 61 toll operating units, involving 36 cities and 11 Companies. As of March 15, most of the Companies had at least one office on a mark sensing basis. The remaining Companies have plans under way for a mark sensing office at an early date.

As of the first of the year, more than two million messages monthly were being recorded under mark sensing procedures. On the basis of Companies' plans, it is anticipated that about one-third of all operator-handled messages will be mark sensed by the end of 1959, with conversions substantially completed by the end of 1960.

H.M.T.S. *Monarch* set out from Great Britain on March 15 to begin paying out cable along deep-sea sections of the telephone cable system that will directly link North America and the European continent later this year. At a point just off Penmarch, France, she began placing cable toward the western terminal at Clarenville, Newfoundland. When all the cable in its storage tanks has been payed out, an operation expected to be completed by early April, the *Monarch* will buoy the end and turn back to Europe for 1,000 more miles of cable. As the system involves twin cables, a second cable will later be laid in a similar type of operation. The shore ends were laid last year. The new system will primarily serve France and Germany but some of its 36 circuits will be extended to Belgium, Italy, the Netherlands, Spain, and Switzerland.

LONG LINES FACILITIES have been helping in the gathering of vital data radioed from Pioneer IV, the new satellite which the National Aeronautics and Space Administration and the U.S. Army fired deep into space beyond the moon. These facilities comprise a communications network between NASA's data center in Pasadena, Cal., and widely separated ground tracking stations. Private line telephone and teletypewriter circuits connect all stations with Pasadena, except for certain locations using TWX to transmit data.

When the rocket bearing the new satellite roared off from Cape Canaveral, Fla., on its space-probing mission on March 3, its radio signals were collected at the tracking sites and the data transmitted over the network to the data center. There, the information was immediately fed into a computer so that the actual course of the rocket could be plotted within a few minutes. Subsequently, important data on radiation in outer space, radioed from the satellite as it continued on its flight, were carried over the same network.

Quick dissemination of press releases and public announcements was made possible by private line telephone and teletypewriter circuits between NASA headquarters in Washington and the Atlantic Missile Range at Cape Canaveral, as well as a "foreign exchange" circuit between Washington and Los Angeles.

OUTSIDE PLANT ENGINEERS at Bell Laboratories have recently initiated two test programs, one to give data on undersea cables and a second to study materials placed in the earth.

For the cables, a "dry-land ocean" has been constructed at the Laboratories test location in Chester, N. J. This is a concrete trough containing steel tubes in which samples of cable are placed. Salt water at a pressure of 5,000 pounds per square inch surrounds the samples, to simulate conditions at ocean depths of about 12,000 feet. Test engineers will closely watch how electrical characteristics of the cable change with time.

The other test program is taking place near Bainbridge, Ga. In a plot of moist, rich earth, about 11,000 samples of telephone materials are to be buried, then inspected periodically to determine how they are affected by moisture and biological activity. Plans call for an additional plot with a different type of soil, so that results will be representative of most conditions throughout the United States.

QUARTZ CRYSTALS, used in many Bell System electronic circuits, have gone into pilot production at Western Electric's Merrimack Valley Works in North Andover, Massachusetts. The process, which has been under study at Bell Laboratories for several years, requires high-temperature and high-pressure conditions—in a combination believed to be as severe as any encountered in present industrial processes. Laboratories apparatus grew crystals about ¾ inch by 1½ inches, and Western's pilot equipment results in crystals up to 3 inches by 6 inches. Emphasis, however, is on finding the best process methods rather than growing the largest crystals. (See the illustrations on page 38.)

TASI is an important new word in the telephone lexicon. It identifies the "Time-Assignment Speech Interpolation" system – completely transistorized equipment scheduled to be applied to the transatlantic cable during 1960. The object is to increase the capacity of the cable by using the short periods of "idle time" occurring in telephone conversations. Over a four-wire circuit, the transmitting and receiving sides are each idle about half the time, and even as a person is talking, there will be short pauses between "talk-spurts." TASI takes the individual talk-spurts and distributes them over the available facilities, so that there can be up to twice as many telephone conversations being handled as there are channels. Bell Laboratories people have studied such techniques for many years, but costs have been judged too high except for special applications such as the transatlantic cable.

The Blue Pencil

CHANCES ARE you never saw Angus A. Macdonald. But it is quite likely that you are familiar with a picture, widely distributed throughout the Bell System in years past, which represents him. For Angus Macdonald posed for the original "Spirit of Service" drawing, executed some time in 1888 at the suggestion of the general superintendent, Angus S. Hibbard, of the American Telephone and Telegraph Company – then the "long lines" organization–to mark an event in the history of the young and struggling telephone service. The picture shows a lineman, belted, storm-blown, and equipped with his tools, standing on snowshoes and gazing up through whirling snow at the wires on a telephone pole line.

Angus Macdonald died on December 20, 1958–almost a year past the seventieth anniversary of the event which the picture commemorates: The Blizzard of '88.

That's a long time ago, you say, and there have been tougher storms since then. True enough–but there were circumstances which gave it special significance.

The blizzard struck hard at an East which was far different from the environment of our day. There were no sky-lines–as we know them. Homes were mostly of two or three or four stories, heated by coal stoves, and lighted by kerosene lamps and candles or, in the cities, by illuminating gas. Horse cars ran on city streets, for it was basically a horse-and-buggy era, and people were much more dependent on themselves and their own efforts and resources. The biting wind and whirling snow which began on March 11, 1888, piled into overwhelming drifts and created a situation of near-catastrophe. Railroads and highways were blockaded, telegraph lines were down, there was no mail, and cities throughout the East were effectively cut off from one another.

With one exception! For the newly completed long distance telephone line between New York and Boston, with its heavy copper wires and stout poles, stood firm. And thence comes the telephone drawing of the blizzard, now 71 years past.

There were two principal participants in our drama. In Boston, Angus Macdonald was one of a gang patrolling the new inter-city line throughout the storm, repairing breaks and protecting the service. In New York, Jack Stange was a lineman who established a connection through to Boston for a newspaper reporter, G. H. Dickinson of the New York *World*. They, too, are now dead.

Dickinson was also correspondent for the Boston *Daily Globe*, and was anxious to file his story of the storm's effect on New York. Making his way to the Cortlandt Street office of the American Telephone and Telegraph Company, he asked Mr. Hibbard for a line to Boston, and was introduced to Stange as the man who could help him. On March 13 together they battled the drifts to Kings Bridge, about 10 miles from New York's City Hall. There Stange climbed a pole and cut in on a circuit, while Dickinson turned the crank on the telephone below. After many efforts, and amid a curious crowd, he reached first Springfield and then Boston. His story appeared in the Boston *Daily Globe* of March 17 and featured a description of the difficulty experienced in making the call between the two

An early reproduction of the original drawing of "The Spirit of Service," before it had acquired that title

An anniversary gathering in A. T. & T.'s Historical Library on March 12, 1938. From left to right: Jack Stange, J. L. Kilpatrick, Angus Macdonald, T. G. Miller, W. S. Gifford

cities. It contained a paragraph which was probably the first published tribute to the spirit of service of telephone people.

Thus prosaically recorded, there seems to be little of importance to be described so many years later. But there is an aftermath.

Twenty-one years ago this March, and therefore fifty years after the big blizzard, a semi-centennial observance of much interest was held in the Historical Library of the A. T. & T. Co., then located on the twenty-sixth floor at 195 Broadway. Its two rooms were crowded with contemporary newspaper clippings, old photographs, telephone equipment of the time, and other memorabilia—all painstakingly brought together by the then Historical Librarian, Robertson T. Barrett, who is now retired. The exhibit was open from March 11 through March 18, 1938. Messrs. Macdonald and Stange were the guests of honor, and they were feted accordingly. The exhibit was officially opened by Walter S. Gifford, then president of A. T. & T., who greeted and welcomed the two veterans of the blizzard.

Other officials of the time who were present were T. G. Miller, head of Long Lines, and J. L. Kilpatrick, president of the New York Telephone Company. Members of the press attended, and the occasion attracted some attention in the papers. During the period of the exhibit, 605 visitors signed the register, of whom 466 were telephone people—and there were uncounted others. It was the biggest and most successful affair of its kind arranged by the Historical Library—which now exists principally in files and records.

This reminiscence was evoked by the death last winter of Angus Macdonald—probably the last telephone man to have had anything to do directly with the Blizzard of '88. But a New York group, "The Blizzard Men and Ladies of '88," held its annual luncheon meeting on March 12 last, as usual.

THE PAINTING on this issue's cover is the third executed for us by artist Charles Mazoujian. Readers may recall last summer's scene of the inoculation of employees against Asian influenza, and the dramatic red and black flags of the hurricane warning flying on our cover for Autumn 1955. JSB

40,000,000 More People Will Need Telephone Service

Good and abundant telephone service is an indispensable part of the progress, prosperity and defense of the country.

As the population grows and grows (it will be increased by 40,000,000 by 1970) it is clear that more and more communication service will be needed.

This will require large amounts of new capital and the telephone business must have good earnings to provide the service and compete for the investor's dollars. There is no other way.

Sometimes there is a tendency to think that the approval of adequate earnings is wholly in the interest of the company and that it should be resisted automatically, regardless of the need.

Actually it benefits you as a telephone user, your community, and your state.

The gain is not only in direct telephone jobs and wages but in helping each state encourage and attract other businesses. You cannot keep prosperity up while regulating telephone expansion and employment down.

NEW CUSTOMER!
Over 11,000 babies are born every day in the U.S.

Telephone users benefit by sharing the economies and efficiencies that come from being able to plan and build ahead. A repressive policy on company earnings, by limiting research, progress and long-term economies, would lead almost inevitably to poorer service at a higher price than you would otherwise have to pay.

Bell Telephone System

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